AN ADDRESS ON THE SURGICAL TREATMENT OF ABSCESS OF THE LUNG AND EMPYEMA.

Being an Introduction to a Discussion in the Section of Surgery at the Annual Meeting of the British Medical Association, held in Glasgow, August, 1888.

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In consenting to open a discussion on such a large and important subject as the surgical treatment of empyema and of abscess of the lung, I fear that I have somewhat rashly undertaken more than, with the little leisure at my command, I am able to do full justice to. My chief aim, therefore, in this paper, will be to draw attention to, and invite discussion upon, certain points in pulmonary and pleural surgery which have forced themselves upon my attention in the management of cases of suppuration near the diaphragm, and to draw attention besides to some points of practice which have recently been under discussion, and which may be considered as being as yet *sub judice*.

Although it is only within the last few years that the question of pulmonary surgery has come to the front, and has commanded a full share of the attention of physicians and surgeons, so much has been accomplished and attempted, that I must crave pardon if I fail, within the limits of this short paper, to give due credit to the pioneers in this excellent work.

My attention has been more especially drawn to this question by four cases recently under my care, in which suppuration occurred, and was discovered and treated, in the region of the base of the right lung. Two of these recovered after incision and drainage, the two others died. In two cases besides, in which abscess in the region of the diaphragm was suspected, I explored with the aspirator freely, the patients being under the influence of ether, but without success, no pus being detected. Both patients died within a few days, unrelieved. Five of these cases were attended in conjunction with Dr. Allbutt, and the sixth in conjunction with Dr. Eddison. I will give the points in the four cases in which pus was found, and will add two similar cases related to me by personal friends.

CASE A, reported in the *Lancet*, July 6th, 1884.—Mr. B., a patient of Mr. Ireland, of Tadcaster, began to be ill with pain about the colon, and transient obstruction of bowel. After some months of indefinite illness, dulness was discovered in the lower half of the right side of the thorax. As this was supposed to be pleural effusion, I was asked to tap the pleura. The first introduction of a fine trocar and cannula, aided by aspiration, brought away a few drachms of clear pleural fluid only. I therefore explored at another point, thrusting the trocar more deeply, and then drew off offensive thin pus, which did not flow readily through the cannula, but, by aid of aspiration, was drawn out to the extent of a pint. Ten days later the dulness was as great as ever, and the patient began to expectorate stinking pus. Under ether I first established the fact of the offensive pus, which I then expected to find in the pleural cavity. On opening the pleura, a small quantity of serum escaped, and I could feel the lung close to the wall of the chest. Knowing that pus was present, I again thrust in the trocar, and, guided by the cannula, passed my finger into a large cavity in the lung filled with most offensive pus, into which a large drainage-tube was inserted. The gentleman, aged 54, was perfectly well in five months.

CASE B.—Mr. A., under the care of Dr. Johnson, of Kirkby Overblow, after suffering for many months from attacks of intense pain about the epigastrium, sometimes attended with peritonitis, had recently commenced to expectorate most offensive pus. Dr. Johnson, considering that there must be abscess of the lung, requested me to see the patient, with a view to exploration of the thorax. I found dulness of the lower half of the right side. The patient being under ether, a trocar was inserted about the posterior border of the axilla, and a pint of clear, sweet, pleural effusion was drawn off. No sign of abscess. As there was still much dulness about the anterior axillary border, the trocar was again in-

troduced at the upper border of the eighth rib, five inches and a half from the nipple, and immediately stinking pus flowed out. Guided by the cannula, I opened the pleural cavity between the seventh and eighth ribs, and introduced my finger into the comparatively healthy pleural cavity whence the clear serum had been drawn. Then, to my surprise and dismay, I found that the cannula passed through the diaphragm into an abscess which lay beneath the diaphragm. After some consideration I enlarged the opening through the diaphragm, discovered that the abscess lay above the liver, the surface of which was smooth, and introduced a large drainage-tube.

In the course of twenty-four hours his condition became extremely critical, in consequence of the rush of air into the thorax at each inspiration, which not only embarrassed the right lung, but interfered with due action of the left. By dint of perseverance and ingenuity Dr. Johnson succeeded in sealing up the incision in such a manner as to prevent the inrush of air without destroying the drainage, and so restored the mechanical power of inspiration. In twenty-four hours the danger had passed, the sound lung was working perfectly, and the patient was at ease. In three months all was well, and he was able to address a large assembly.

CASE C.—Mr. S., a patient of Dr. Ormsby, of Slaidburn, was suffering from symptoms of abscess of the upper part of the liver, and I was asked to explore. A trocar passed between the tenth and eleventh rib discovered pus. Following the course of the cannula I made a free incision, and, introducing the finger, discovered a large cavity bounded below by a ragged surface of the liver, from which three pints and a half of sweet pus escaped. Turning the finger upwards towards the diaphragm I discovered an opening through the diaphragm that would admit two fingers, evidently leading to the base of the pleural cavity. Unfortunately I did not make a second opening between the ninth and tenth ribs, so as to give direct drainage to the cavity above the diaphragm, but contented myself with inserting one large drainage-tube into the hepatic cavity, and a second large tube upwards through the opening into the pleural diverticulum.

For a week all went on very well, with a normal temperature and great relief. Then febrile and hectic symptoms returned, as if the pus were imperfectly escaping. At the end of six weeks I made a second opening between the ninth and tenth ribs, into a large cavity between the base of the lung and the diaphragm, which communicated with the hepatic abscess through the opening in the diaphragm. Relief from the second operation was but transitory, and he died at the end of two weeks from the second operation.

CASE D.—Mr. P., a patient of Mr. Carter, of Chapel Allerton, in the course of an illness began to expectorate fetid pus. There was dulness about the base of the right lung. A large collection of most offensive pus was found by incision between the ribs, and drainage was established. There was not the relief expected, and he sank at the end of a week. At the *post-mortem* examination the abscess was found to have burrowed behind the liver, and in the posterior mediastinum, and recovery under any circumstances of treatment seemed to have been out of the question.

To these cases of my own I may without impropriety add two others which have been related to me by medical friends, both of which recovered.

Mr. R. N. Hartley, of Leeds, gives me particulars of the following case: A female, aged 27, suffered from acute pleuropneumonia, followed by very slow convalescence, with an uneven temperature, dulness at the base of the left lung, pain with orthopnoea, and then sudden expectoration of offensive pus. Puncture with a trocar between the seventh and eighth ribs, just in front of the angle, discovered pus. Guided by the cannula, he incised and exposed the lung, continued the incision through the lung until he reached and let out about a quart of stinking pus. The cavity was drained. In three days all urgent symptoms had gone and the patient could lie down. The patient made a slow but uninterrupted recovery.

Dr. Davies, of Swanton, tells me the following case: A farmer, aged 21, in July, 1885, suffered from left pneumonia, and was laid up the following winter, expectorating pus. In the spring of 1886 the left lung was well, when the right lung fell amiss, with expectoration of pus, often in great quantities, even a quart at a time. This continued until June, 1887, when the expectoration became horribly fetid. In March, 1888, he became worse and seemed to be sinking. On April 1st Dr. Davies gave chloroform, made an incision into the thorax, and tapped the lung, letting out

a quart of pus. The drainage-tube was removed on May 17th. On July 9th the patient had been for some weeks apparently well, the lung being fairly resonant.

If we look into some interesting papers published in *Guy's Hospital Reports* by Dr. Hilton Fagge in 1874, we shall find that abscesses such as I have described have been found not infrequently in the *post-mortem* room; and, reading these cases by the light of our recent experience, we shall be struck with the fact that the physician or surgeon, though face to face with evidence of a collection of fluid about the diaphragm, sometimes with evidence that that fluid was pus, failed to drive at the source of mischief, either withholding the exploring trocar altogether, or, puncturing and missing the mark, they still refrained from repeating the puncture, and so left the abscess to be detected only in the deadhouse. Certain points bearing upon the surgery of the chest seem to be unfolding themselves to our view.

1. We are losing our fear of exposing the pleura and the lung, just as we have learnt step by step how to deal boldly and safely with the peritoneum.

2. The evil of admission of air into the pleural cavity is not the mere exposure of the pleural surface to the air, is not that the lung collapses by the mere admission of the air, but that where there is a fairly healthy lung and pleura, the inrush of air reduces to a serious extent the mechanical power of the thoracic wall over the function of inspiration.

3. That in cases in which this mechanical difficulty threatens the life or impedes the recovery of the patient, surgery must decide upon the best method of closing the wound to the inrush of air whilst allowing adequate drainage of any pus cavity to be carried on.

4. That the region of the diaphragm is a situation in which abscess amenable to surgical treatment frequently occurs, such abscesses often commencing below the diaphragm, and tending to discharge through the diaphragm and through the lung.

5. It seems probable that such abscesses can be more safely attacked through the lower angle of the thorax, provided there be dulness at the seat of puncture, than through the abdominal wall.

6. As to washing out the cavity of a large pleural, or pulmonary, or hepatic abscess, it is probable that antiseptic washing is of value in the early period, whilst the cavity is offensive; but that, as soon as the secretion has become sweet, washing is not only unnecessary, but tends to disturb the comfort of the patient, and retard his progress. If drainage be effective, so that fluid does not lodge, the fluid, which is sweet when secreted, should escape from the cavity before it has time to deteriorate.

7. As to the question of excision of portions of rib in treating empyema, on this point I am unable to speak from personal experience. The tendency of surgical opinion seems to be rather to reserve it for special and exceptional cases than to make it a general rule of practice.

Sir SPENCER WELLS said that the only patient he had known for whom an abscess of the lung had been drained more than forty years ago was still alive and well. He was admitted into Malta Hospital in 1843 dying of phthisis, and a report of the case was published soon afterwards in No. 166 of the *Edinburgh Medical and Surgical Journal*. An abscess had formed in the right axilla, which was opened. Air and purulent matter escaped at once, and large quantities of matter resembling that expectorated in advanced stages of phthisis continued for a long time. Cough and expectoration diminished; so did the discharge, the opening closed, the man recovered strength, and when sent home to England dulness of the right subclavicular region was the only physical sign of disease remaining. So long as forty years ago he (Sir Spencer) had published his opinion that the case encouraged the practice of making incisions into the lung in cases of abscess, and encouraged the hope that when only a portion of one lung was affected, and the pleural surfaces were adherent, a free external opening would relieve the bronchial irritation and its concurrent evils. He would not enter upon the further question of the treatment of empyema, or the incision of the lung in cases of gangrene, or of removal of portions of diseased lung in some exceptional cases, but looked forward with hope to good results from such practice hereafter.—Dr. WARD COUSINS said that the essential purposes of early treatment in cases of thoracic abscess and empyema were re-expansion of the lung and closure of the cavity, but these desirable results were often surrounded by great difficulties, especially when surgical treatment had been delayed.

He had, during the last few years given up fine tubes and aspirators, and removed the fluid by siphon action, assisted by the occasional use of an exhaustor. This method was very satisfactory in the case of young children, but in older patients he always practised free incision. It was often much easier to cut out from an abscess cavity than to cut into it, in consequence of coagulated fibrin and thick purulent deposit lining the wall of the thorax. He always first introduced an antiseptic trocar, and as soon as pus was reached he turned the instrument into a knife and opened the cavity freely in direction of the intercostal space. The operation could be performed with great rapidity. Whenever drainage was inefficient another opening could be made. He did not use drainage-tubes after the first few weeks, for they often caused irritation. The incision could be left open by daily dilatation, and for this purpose he employed an inflatable bag. [The bag was exhibited.] When the opening was narrowed and the orifice was generally the point of obstruction, he recommended the excision of a piece of a rib. In cases of empyema associated with pulmonary fistulae and fetid secretion, free incision could be practised with great relief, followed by irrigation until the discharge had lost its offensive character. Often during recovery inflation of the chest by forced inspiration was of great value, as it aided in the expansion of pulmonary tissue not hopelessly injured.—Mr. JESSOR (Leeds) said that having been called upon by the President, at Mr. Teale's suggestion, he could not but comply, although he feared his remarks might not be considered quite in point. He would premise that if fluid had been diagnosed, it was the surgeon's duty to demonstrate its presence or absence whether in the pleural cavity or in the lung substance, and if present, to evacuate it. It would sometimes happen that a healthy pleura would be opened. In such an accident, he was able to assure the meeting that the danger was more apparent than real. It had on two occasions happened to him to open the pleural cavity accidentally—once in two places during the emptying of the axilla of carcinomatous glands, when also the occluded axillary artery and vein were in part removed; and again, during the removal of a large enchondroma, together with the rib from which it had sprung. In both instances air entered the chest freely, and was as freely emitted through the artificial opening during the respiratory movements; and in the latter case it was plainly observed through the exposed transparent pleura that the lung maintained its position, size, and shape, without showing any signs of collapse. The first-named case made a rapid recovery without any untoward symptoms, and the latter, operated on ten days ago, showed no signs of pleurisy or other evil result up to the present time. It might thus be accepted that a simple incision of the healthy pleura, uncomplicated by injury of the lung, need not become a source of danger.—Mr. JOHN DUNCAN (Edinburgh) said thoracic abscess should be treated like all other abscesses by opening and drainage. Treatment would vary, however, with the class of case. Thus, in children, opening and a drainage-tube would, in almost all cases, be successful; in early adult cases the same was the case, if precautions were taken that the opening should be not so low that the diaphragm interfered with it, and that a portion of a rib be excised to allow the tube to lie easily. In medium cases suction was an advantage, and Mr. Duncan showed an apparatus which he had devised for the purpose. In very old cases, death sooner or later ensued, but might be averted by excision of large portions of the thoracic wall (not less than parts of eight ribs). Mr. Duncan reported four successful cases of this operation.—Dr. WEBB (Wirksworth, Derbyshire) said he could support the views of Sir Spencer Wells and Mr. Teale in regard to the propriety of making a free opening into the pleura, letting out the pus, and daily washing out the cavity with some antiseptic solution in all cases of empyema, keeping a good-sized drainage-tube in the opening during the intervals. Amongst the cases which he had seen in the last thirty years, perhaps the most interesting was the case of a gentleman he had recently seen in consultation with Dr. Holland, of Matlock. The peculiarities in that case were the very low temperature during the acute stage, the rapidity of the effusion, and the absence of all premonitory symptoms. Four days after the first symptom the fluid had reached the second intercostal space on the left side, whilst the heart's impulse was felt below the right nipple. Aspiration brought away 90 ounces of serum. Some weeks afterwards a cold fit occurred, and, pus being detected, a free opening was made, and daily washing and drainage carried on till a fortnight ago, and the case up to the present was doing well. If he were satisfied of the presence of an abscess of the lung, he (Dr. Webb)

would have no hesitation in opening it through the pleura, and treating it on the same antiseptic principles.—Dr. WARDROP GRIFFITH deprecated the habit of excision of a portion of a rib as part of a primary operation, and maintained that satisfactory drainage was obtained in the great majority of cases by simple incision and insertion of a drainage-tube. He discussed the manner of re-expansion of the lung after operation, and held with Dr. Robertson, of Oldham, that Mr. Rickman Godlee's explanation was inadequate for the majority of cases, but that it was brought about by the valvular action of the dressing. He held that, when an empyema was incised, the functionally active portion of the lung did not collapse, and quoted some observations and experiments brought forward by Dr. Samuel West in the Bradshawe Lecture as lending support to this view.—Mr. WINKFIELD (Oxford) reported a case of empyema, in which an india-rubber drainage-tube was in use, made with a shield by splitting up a drainage-tube and spreading out the ends upon a pad of carbolised lint. Upon one occasion of dressing the shield came away, but the tube was missing; it was not in the dressing, and could not be felt in the wound. A few days later the temperature was going up, and an incision was made, and the finger, being introduced into the wound, felt the tube lying just inside the chest. It was easily removed, and after that time the discharge continued getting less and less, and the patient made a good recovery.—Mr. EDMUND OWEN remarked that in children the intercostal space was so small that it did not, as a rule, allow the easy admission of a good-sized and serviceable drainage-tube. Therefore, if there be any apprehension upon that subject, the surgeon would do well, almost as a routine practice, to resect about half an inch of the rib. Sometimes the physician called in the aid of the surgeon in the treatment of suppurating pleura, because the cavity was not draining with sufficient freedom, and this was almost certain to be when a piece of rib had not been excised. Then, after the resection, drainage went on well, and convalescence became established. Sometimes also the surgeon's aid was called in because a drainage-tube had slipped into the pleural cavity and could not be extracted. This was because a bad style of drainage had been adopted. The best kind of apparatus was that in which a good-sized, stiffish india-rubber tube had one end split into four pieces, this end being passed through a hole in a thick piece of mackintosh about an inch square, the ends being turned down and stitched with silver wire. This convolvulus-blossom tube could not possibly get adrift into the pleura, nor could it slip outward when its flanged part, which lay upon the surface of the chest, was covered with the absorbent pads. Mr. Owen then briefly alluded to a case of hydatid upon the convex surface of the liver (which he had already brought before the Clinical Society), and in which the hydatid was reached and successfully evacuated by a deliberate attack across the healthy pleural cavity. The pleura was opened at about the eighth intercostal space, the diaphragm was incised, and the cyst-wall was brought up across the narrow crevice between the costal and phrenic pleura, fixed by hare-lip pins, and, in the course of a few days, duly evacuated. Instruments and fingers were clean, and absolutely no inflammation of the pleura followed. The lung subsequently descended to its proper level, and perfect recovery in every other respect resulted. Mr. Owen was of opinion that if the surgeon used as much care in operating upon a healthy pleura as he did upon a healthy synovial membrane, the peritoneum, or the arachnoid, it would be found as amenable to treatment as any of those other membranes.—Mr. JORDAN LLOYD asked how Mr. TEALE would distinguish between pulmonary and pleural abscesses. He referred to two cases where separate punctures, made at the same time, had yielded different fluids—namely, serum and stinking pus, and these cases were thought to be interlobular empyemata rather than intra-pulmonary abscesses. With regard to empyemata he pointed out that "freedom of drainage" might be gained both by extending the length of an incision rather than by increasing the diameter of a tube.—In reply, Mr. TEALE said that the question of the advisability of free opening of the pleural cavity was now established, and that there was abundant evidence that the fear of collapse of the lung was, to a large extent, a bugbear. This fear originated by a misconception from the usual *post-mortem* appearances, and also by an erroneous comparison with the condition of pneumothorax. The importance of preventing as far as possible free ingress of air was insisted on, and a manœuvre by which Trousseau used to effect this was described. With regard to the diagnosis of abscess of the lung from empyema, it was not easy, but treatment was little

affected by this difficulty. The most important distinguishing symptoms were the coexistence of an expectoration of stinking pus, and the evacuation of clear fluid from the pleural cavity.

AN ADDRESS ON THE SURGICAL TREATMENT OF EMPYEMA.

Read at a Meeting of the East Anglian Branch, at Eye.

By HOWARD MARSH, F.R.C.S.,
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WHEN you asked me, Sir, to open a discussion at this meeting, I felt the difficulty of choosing an appropriate subject. I knew that those present would be largely interested in medicine, while, as a surgeon, I was incompetent to touch ever so lightly on any department of medical practice. It was, therefore, necessary that I should take some question that had both its medical and its surgical side, and I selected empyema, not only because it met this requirement, but also because it is a frequent and dangerous condition, and one in regard to the treatment of which many points of novelty and importance remain open for further consideration. I was also anxious to make a brief allusion to the present relations of surgery to medicine, a subject that has lately attracted a good deal of attention, and respecting which I think there is some little misconception. Some physicians complain that surgery is becoming unacceptably obtrusive, and that organs and their diseases which have always, and justly, been considered medical, have been invaded and annexed by the surgeon. The law of *meum* and *tuum* has, they consider, been set at naught, and they seem inclined to remind the intruder of that stern sentence: "Cursed be he that removeth his neighbour's landmark." I regard the matter in quite a different light. There can be no surer evidence of the progress of medicine than that medicine and surgery should meet more and more frequently on common ground, for it is unquestionably the advance of diagnosis that enables the physician to avail himself of surgical methods. How could a physician venture to ask a surgeon to trephine the skull, or the spinal column, unless he could trust his own diagnosis not only as to the existence, but also as to the exact position of a cerebral or spinal tumour? And as in these cases, so it is with the kidney, the liver, and other parts. Even in those instances in which surgery is employed in medical cases merely for exploratory purposes, the diagnosis of the physician has already cleared the ground up to an advanced point. And certainly the intimate knowledge of disease, and the elaborate methods of investigation and reasoning by which medical diagnosis is at present arrived at may well be regarded by the physician, as they assuredly are by the surgeon, who is an admiring witness of them, as amply sufficient to place those who evince such acquirements far beyond detraction, or any risk whatever of being pushed aside. Supreme in his own department, the physician need feel it no loss either of position or independence to ask for surgical aid. It is, on the other hand, the acquirements I have mentioned that render an appeal to surgery inevitable. The physician must adapt his remedies to his cases. In some he uses drugs with which he acts on the circulation; in others, drugs that affect the nervous or the digestive system, and so forth. But some cases can be dealt with only by direct mechanical or operative interference. How else can a stone be removed from the gall-bladder, or a new growth from the spinal cord, or internal strangulations relieved? But here comes in the principle of the division of labour. Operative interference in these and similar cases demands for its safe application prolonged training and large experience in the execution of difficult manipulative proceedings, neither of which has the physician, who is otherwise fully occupied, either time, opportunity, or inclination to acquire. How, then, can he look coldly on the surgeon who supplies him with what may be termed, from the present point of view, the mechanics of medical practice, without which, in many instances, a correct diagnosis is useless to the patient? Medicine and surgery, in truth, are essentially one. In practice they must, as man's powers are finite, be placed in dif-