ON THE TREATMENT OF EMPYEMA.

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DURING the last ten years I have opened and drained the chest for empyema in seventeen cases, in all of them with success. I propose to describe the method employed by me, to discuss shortly certain theories which have been advanced as to the place of incision, and to mention one or two cases and features of interest.

The suggestion of a suppurative fever, as evinced by alternate hectic and sweating, should lead us to examine the chest for dullness, absence of fremitus and breath sounds, and displacement of organs. If some of these be present, even over a small area, such part should be explored by an aspirator. Early recognition is all-important as an element of success. The trocar should have previously been boiled, and should be laid before using in 1 to 40 carbolic solution. The skin, after being well washed with warm soap and water, should preferably be soaked for two hours with a cloth saturated with 1 to 80 carbolic. Just before puncturing, the skin should be rubbed with carbolic oil 1 to 40. A small incision should be made previously to using the trocar, to save the otherwise heavy thrust on its insertion. This wound having been dusted with iodoform, the trocar is slipped immediately over the rib, and passed suddenly through the parietal pleura. If there is pus the chest should then and there be opened and drained; and here is a point upon which I insist, and a point which I have not seen discussed in the accounts of the operation. It is that the incision should be made through and include the channel left by the trocar. Especially should this be the case if the pus is stinking, for such pus seems to be so poisonous as to destroy the vitality of connective tissue almost as rapidly as a corrosive. If the incision is made elsewhere, pus may enter into the trocar channel and burrow amongst the connective tissue planes of the chest wall, with the most troublesome and possibly disastrous results. But if it be a rule that the incision should extend through and include the puncture, the question as to where the aspirating puncture should in the first instance be made becomes all-important. I do not know that this point has been taken into consideration in determining the seat of puncture. But in my opinion it is an exceedingly important point which should not be overlooked, for the trocar puncture has to be made wherever dullness is found, particularly where it is most marked.

The considerations advanced by the late Professor Marshall in determining the spot for incision are, I think, misleading, notwithstanding their interest. (1) We would not aspirate "immediately outside and below the junction of the fifth rib with its cartilage" to explore the nature of a dullness occurring at the back of the chest. (2) Even if this spot be the least covered, and that after long suffering to the patient, the accumulation of pus ultimately selects this outlet (which is not always the case), this should not influence us in the selection of a site for opening the chest in the earlier stages, during which the accumulation may be let out from the back. (3) The consideration as to the advancing lung blocking up the outlet, if this be made behind, is not found to be valid in practice. I have never known it occur. (4) If pus flows out over the edge of a wound made in the anterior part of the chamber containing it, it has a tendency to get between the layers of the cut edges, and to burrow backwards along the intercostal depressions, downwards in the abdominal wall, or elsewhere. In one such case, opened anteriorly, I have had to insert drainage tubes in three distinct strata of connective tissue, at different depths, and extending from the axilla to the crest of the ilium.

Further, it is stated in Erichsen's *Surgery* (eighth edition): "A patient suffering from empyema usually does not lie flat upon his back, but inclined towards the affected side, so as to allow the freest possible play for the sound lung." I believe this to be a purely theoretical statement, but it is quite beside the mark when we are considering whether a patient will lie upon an emptied side, sore with a wound. I can without hesitation state as a fact that he does not do so, and

will not do so if requested. He prefers to lie on his back, tending slightly to the sound side, and can with difficulty be coaxed to lie at all on the side of incision. My experience, moreover, with regard to the original statement is at variance with it. I believe that even with one side of the chest full of fluid, a patient prefers to lie on his back, and this especially if the accumulation is on the left side. The rule, then, should be that, (1) as there is always a preliminary puncture over the maximum seat of dullness, the incision should be also over this region, to include the puncture; and (2) both should be made as far back as possible, to ensure more complete drainage, and avoidance of burrowing in the chest walls. In practice, the most frequent spot we are guided to, if we take this as our principle, is about the upper edge of the ninth or tenth ribs in a line with the angle of the scapula.

It has been objected that here the ribs lie so closely together as to cause a difficulty with the drainage tube. I have only found this to be a real difficulty in one instance; and with regard to obviating it I employ a simple procedure which I have not seen discussed. The usual recommendation is that an inch or more of rib should be resected. This may be altogether avoided by simply dividing the rib. The two ends do not remain in juxtaposition, and the additional space gained is amply sufficient for a drainage tube of the usual size.

The incision should not be "dissected" down; it should be made by two clean cuts, the first, $1\frac{1}{2}$ to 2 inches in length, made firmly on to the ribs, the skin being slightly drawn down. The resulting wound is powdered with iodoform before opening the pleura. At the second incision the knife is thrust directly into the pleural cavity at the anterior edge of the wound, just over the rib and flat to it, with the cutting edge turned to the spine. Keeping it close to the ribs, it is carried backwards to the posterior part of the wound, and the handle of the knife is here inclined backwards so as to leave a bevelled edge, with no "bag" in which pus could possibly collect.

The aperture made should be large enough to admit two fingers, which should always be inserted as far as possible, in order to break up any obstructing adhesions or flakes of fibrinous material. The patient may be rolled or lifted into various positions in order to facilitate the exit of all discharges while this is being done. A good deal of force is sometimes necessary to get the fingers well inside the pleura if the ribs are close together, but the result is complete drainage, and from time to time during the progress of the case it is of the first importance that the fingers should be reinserted, especially should the temperature not fall in a day or two to normal, or should it rise again subsequently. A finger should be inserted once a week during the subsequent dressings, even if all appears to be going on well. I have never once found a counter opening to be necessary.

The only entirely satisfactory tube is the simple one described by Baxter, never more than 3 or 4 inches in length, and this to be soon shortened by degrees at each dressing. The drainage tube should have thick walls, and be stiff, so as not to be easily bent upon itself. The piece of macintosh sheeting through which it passes, which forms its shield, should be also of stout quality, and not more than $2\frac{1}{2}$ inches square. If these points are not observed the drainage tube will be found, again and again, lying out upon the dressing. It will never come out if it is made properly, and if it is kept in position by tapes sewn to the four corners of the shield. Of these, two pass over the opposite shoulder, the two lower round the waist. The only disturbance of the tube now possible is by whatever friction may be caused against the shield by a rotatory movement of the whole dressing, and this is easily prevented by carrying a turn of the flannel binder, or bandage which retains the dressing, over the opposite shoulder, and fixing it by a safety pin. Before inserting the drainage tube it is dusted over with iodoform, and the wound is powdered with the same; a piece of lint, with a slit cut in it, is soaked in 1-80 carbolic oil, and slipped round the tube, so as to interpose between the wound and the shield. The discharges are received into several layers of salalembroth wool, and the whole is retained by two or three turns of a broad flannel

bandage, fixed by safety pins in the manner described. No spray is used at any time.

A rapid cure should be expected in uncomplicated cases if the patient is young. The first of my last three cases, a young man from whom I removed 93 ounces of purulent fluid at the commencement, was perfectly well, and the wound completely healed, in thirty-three days. In this case no general anæsthetic was given, but two or three drops of an 8 per cent. solution of hydrochlorate of cocaine were injected at the point of incision. No pain was felt during the incision.

The last two cases are striking examples of the success of the methods here described.

CASE I.—An apparently dying lady, aged 61, with a temperature of 103°, was operated on on January 17th, 1892, and the tube was finally removed on February 14th. Temperature normal on February 7th. The expulsive power was so weak that the patient had to be lifted up occasionally above the bed by two assistants, with the wound dependent. In that position the finger was inserted into the chest, and the patient was made to cough. A quantity of fibrinous material, and pus which had been blocked up behind it, came away on January 27th by this method. She is now (March 6th, 1893) in excellent health.

CASE II.—J. C. P., aged 30, dark lank hair, cadaverous appearance. In June, 1891, had severe attack rheumatic fever, lasting ten weeks. In February, 1892, a slighter attack. About middle of September, 1892, began to have pain left side of chest; no cough. After a week or two began to lose appetite. Continued at work with increasing dyspnea; still no cough. Began to feel sick on October 1st. Pain in side worse night and morning, and always increased by lying down. Continued out of doors till October 4th, when the pain grew acute. On the 8th, midnight, there being marked dulness, with displacement of the heart, and great increase of pain, he was aspirated over the spot of maximum dulness, in this case at the upper border of the tenth rib below the angle of the scapula. Pus was obtained, most horribly fetid. The needle and the metal parts of the aspirator were blackened by contact with the pus and its gases. Early on the 9th the chest was opened at the upper border of the tenth rib, in the manner described. A rise of temperature from October 26th to the 30th was due to the drainage tube coming out; this was prevented by obtaining a thicker sheeting material for the shield. Another rise on November 6th was caused by the wound having closed up too rapidly and the tube becoming compressed. The wound was freely dilated with the finger and a drainage tube of stouter material procured. The wound was again dilated with the finger when the temperature rose on the 15th. The patient suffered from a very troublesome and offensive diarrhoea on October 25th, and also on November 7th, which was not entirely controlled until November 19th. From this time convalescence was uninterrupted. The drainage tube was finally removed, and the wound allowed rapidly to heal, on December 7th. At the time of operation the patient was dusky in hue, the pulse almost imperceptible, and he was apparently moribund. He again was brought to the verge of death by the profuse diarrhoea. He is now (March 6th) in good health, though the breath is slightly short sometimes. There is no sensation of pain or dragging on the affected side; no cough; appetite thoroughly good. The dulness is but slight, though at the aspiration more than 80 ounces of pus were removed. The heart's apex beat is $2\frac{1}{2}$ inches below and $\frac{1}{2}$ an inch outside nipple. A horizontal measurement 2 inches below nipple gives for the right side 15.4 inches, for the left 14.5. A result which is certainly very satisfactory.

These three cases all occurred in the practice of Dr. Fitzsimons, of Hereford. The early suspicion of their nature was due to him; and to this fact, and to his care, they owe their recovery.

DO PARASITES EXIST IN CANCEROUS TUMOURS?

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THE answer to this question cannot as yet be given by a simple yes or no. As a contribution towards an affirmative answer I beg to offer the following memoranda.

So long as the organisms accounted parasitic have not been cultivated, so long as inoculation experiments have yielded nothing of moment, the opinions of those who deny the presence of parasites in cancer are entitled to the greatest possible respect. While fully admitting the *experimentum crucis* has yet to be made, I venture to regard many of the cell inclosures met with as parasitic organisms, basing my opinion on a careful study of what has been written by others on the subject, and a patient investigation for myself of the differences between tissue cells, epithelial and other, and the bodies which have every appearance of being foreign importations. It is the conflict of auto- and hetero-genesis over again.

Failing three out of four of the conditions laid down for establishing the pathogenic character of any micro-organism, pathologists are at present engaged in a careful study of the life history of the supposed parasite as it can be traced in the

tissues, and especially in attempts to demonstrate a reproductive process. It is to the latter process that my remarks chiefly relate. I am well aware appearances have been described by Foà and Soudakewitch, Dr. Ruffer, Mr. J. J. Clarke, and others, which they believe to indicate a reproductive process. I append drawings from my sections, but have had no opportunity of comparing them with any others professing to depict sporulation, etc.

When I first recognised the parasite in stained sections, the majority of forms appeared to measure about 8 to 12 μ in diameter. After a time I became aware of extreme variations in size. Connected by imperceptible stages the size of the parasite may be traced from a mere speck, seen under a high power, to a large cyst-like body 20 μ or more in diameter. The nucleus of the parasite also varies in size relatively to the surrounding protoplasm. In some of the medium-sized bodies it may be only just visible, while in others no larger it may almost fill the capsule. I am unable to say whether the small-nucleated forms pass into the large-nucleated ones; it is only in the latter that I have observed anything resembling a "sporing" process, but it is possible that the former undergo simple division like other unicellular organisms.

Fig. 1

n. Nuclei of epithelial cells. A. Large parasite with well-defined capsule, containing large homogeneous nucleus. ($\frac{1}{2}$ " ocular 2. The same power for all the drawings.)

The bodies to which this description relates can be seen both in stained and unstained sections; they are not dissolved out by soaking in ether, or blackened by osmic acid 1 per cent. In the majority of the parasites the nucleus is structureless and homogeneous. When the organism is about to multiply it becomes converted into a finely granular refractile mass (Fig. 2). This mass may either fill the outer capsule, or be

Fig. 2

B. Contour of parasite irregular, nucleus large, finely granular, almost filling capsule ("sporing" stage).

separated from it by a clear space. Smaller masses may be seen detaching themselves from the main mass, and finally subdividing into refractile micrococcus-like particles. These spore-like particles may commence to grow while still within the parent cyst, or may escape while still very minute (Figs. 3 and 4). They may be seen in the interior of newly infected

Fig. 3

C. Capsule containing in the centre a large nucleus, and a number of young parasites developing within the parent cyst. cells, or lying free near the cyst from which they emerged. Very frequently no breach can be seen in the cyst wall, hence