THE ISOLATION AND TREATMENT OF WOUNDS.*

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APART from the theories with which it has been supported, the great objection, practically, to the antiseptic treatment consists in the complicated nature of the precautions with which it is hampered. I propose in this paper to describe a plan for the treatment of wounds which is perfectly simple, which has the advantage of having no particular novelty to recommend it, and which has given results quite as satisfactory as, if not more so than, any which have been claimed by the advocates of so-called antiseptic surgery.

This table will suffice to prove that the treatment has been followed by the good results which I claim for it. All the patients, whose cases are here tabulated, were treated in the wards of St. Bartholomew's Hospital; and the table includes all who have been under my care, for the causes specified, since I have held office as surgeon, except in the table of amputations, which contains, in addition to my own, ten cases, consecutive with the remainder, which were under the care of Sir James Paget.

	Totals.	Died.	Recovered.	Fatal cases.
Operations (excluding those for hernia).....	199	6	193	
Compound fractures	28	0	28	1. Ovariectomy.
Amputations at the thigh ...	14	0	14	2. Ovariectomy.
" " leg	14	0	14	3. Nephrotomy.
" " arm ...	2	0	2	4. Lithotomy.
" " forearm.	3	0	3	5. Syphilitic laryngitis.
	33	—	33	6. Cystic tumour

The treatment of these wounds may be considered under distinct headings.

a. Removal of Foreign Bodies.—It is needless to dwell upon a condition so essential as this to the after-healing of a wound, but a reference to it leads me to remark (1) that all wounds made by the surgeon should be cleanly cut; for instance, the circular incision through muscles in amputation at the thigh should be made, as it can be, but is not always, with one sweep of the knife; (2) that amongst foreign bodies should be included ligatures, the use of which I always avoid, if possible, having employed torsion in nearly every operation. A surgeon, who has any doubt as to the facility with which vessels can be thus secured, may use the carbolic catgut ligatures; but these are but a poor substitute, and should, in my opinion, be only used exceptionally, as, for example, when it happens that an artery, such as the femoral, gives off numerous branches just where it has been cut across. It is then difficult to twist, and I have twice, amputating high up in the thigh, thought it right to tie the femoral under such circumstances. The facility with which arterial bleeding can be stopped by torsion depends upon the accuracy with which the vessel is seized by the torsion-forceps independently of surrounding tissues; for, if these be included, the twisting often fails. By torsion, we avoid all risk of secondary hæmorrhage (as distinguished from recurrent bleeding), and we leave the wound entirely free from introduced foreign bodies, such as ligatures.

b. First Dressing of Wounds.—After all bleeding has been stopped—and it is important that the wound should not be closed until all hæmorrhage has ceased—the surfaces may be washed with carbolic acid lotion (one part of acid in twenty of water). It is then closed with silver sutures, carbolic gut being in many cases objectionable as it is apt to give way prematurely, especially when opposed to any considerable strain. The wound is then fitted with a drainage-tube. It has been a matter of some trouble to find a tube quite suitable for this purpose; but, after various trials, I have had one made which holds itself in by means of a very simple arrangement of a spring, which can be protruded from one extremity, whilst at the other end a shield of metal prevents the tube from slipping wholly into the wound. This tube, as may be seen, is perforated at many points, so as to ensure free discharge through its canal.

I do not think it possible to exaggerate the importance of securing this drain for the removal of fluid from a wound (when otherwise it would be shut in) for the first twenty-four hours, after which time the tube can usually be removed. It is especially necessary to attend to this want when carbolic acid washing is used, in consequence of the

great quantity of fluid which then flows from the cut surfaces, and which is hurtful if retained.

The wound being thus closed and drained, some layers of lint soaked in carbolic oil (one part of acid to twelve of olive oil) are laid over the line of incision, or over the laceration, if such it be, and over these it is my custom to lay a quantity of cotton-wool for warmth and for protection simply, for at present I am not prepared to assign any especial virtue to its use. This mode of covering wounds has, it may be stated, been in use at St. Bartholomew's since the introduction there of carbolic acid in the year 1863.

c. Rest.—After this first dressing, the wound has to be placed in such a position as will subsequently ensure for it absolute rest. For example, after the removal of a breast, it is necessary to avoid all pads and bandages, which tend to fix the outer parts of the wound, whilst the inner move to and fro in the act of breathing. It is not likely that a wound of this kind will heal by first intention, unless left comparatively free; and I consequently close it with sutures, and then simply secure it further by the position of the arm, which is fixed, a strap of plaster holding the dressing of oiled lint in its place. The chief difficulty I have had to meet has, however, been in securing for amputations that rest which, as our President has taught us, is so essential to their repair; for, in such cases, provision has to be made, not only for temporary quiet, but for the avoidance of all disturbance of the parts during the after changing of the dressings. To obtain these advantages, I have had made and have employed the splints which are now shown, and which are swung by straps, so as to allow the patient some little freedom of movement, without risk of disturbing the stump; and it will be seen that each is provided with a catch and hinge, by which a portion of it can be lowered, so as to allow the surgeon to dress the wound without moving the limb. This arrangement, which we first used on the suggestion of Mr. Brewer, my house-surgeon, for a Syme's amputation, I now invariably employ, and the dressing of amputation-wounds has been thus rendered a well-nigh painless operation. There was some little difficulty in adapting a splint for thigh-amputations; but we have now one which works well, and which should have been shown here this morning, but that I was obliged to use it yesterday for a thigh-amputation; but it may be seen at St. Bartholomew's in use by any who may take an interest in the matter. In making arrangements for swinging limbs which are wounded, provision ought to be made for *ventilation*. This refers more especially to wounds of the lower extremities; and, to ensure this, and also to do away with the inconvenience caused by the upright rods of an ordinary cradle, the swing now shown is employed. It fits by a screw to the foot of the bedstead, and carries two rods on which cross-bars slide, and from the outriggers of which the limb is suspended. By arrangement of the bed clothes over this, a free ventilation from the foot of the bedstead is easily established.

d. Isolation.—After the first day, the wound is again dressed, the drainage-tube being now usually removed; and the dressings are renewed on the same plan as before, consisting of two or three layers of lint soaked in carbolic oil, and over this some cotton-wool; but, during the dressing, and indeed afterwards, no especial provision is made for the exclusion of the air. As far as is practicable, each important wound case is placed between patients free from wounds or discharge; but the isolation of each wound is practically effected by the plan of cleansing which is employed. This rod, carrying an ordinary test-tube, is suspended at the head of the patient's bed, and in the glass is placed, and renewed every day, a solution of one part of carbolic acid in five of rectified spirit of wine; in this is kept a camel-hair brush, and with this each wound is cleansed. By its use, discharge is expeditiously removed, and it has this advantage—that, not causing pain by its contact, it is very acceptable to the patient, whilst it necessitates gentle handling on the part of the attendant, for it is impossible to be rough with so delicate an instrument. Besides its value in lessening the risks of spreading infection by its use being entirely limited to the one patient, this plan of dressing assists in ensuring that rest which is so essential, for by its means wounds can be cleansed with a minimum of disturbance of the parts; and I do not think that anyone who has tested it would think of using anything in preference for the removal of discharge, especially where it has to be cleaned from fissures and recesses not easily reached by other methods. With this plan of wound-dressing, the results have been obtained to which reference was made at the beginning of this paper, and, in the great number of cases, primary union has followed the treatment, the most rapid recovery having been that of a patient who was up and dressed fourteen days after amputation at the thigh.

e. Antiseptic Treatment.—From what has been said respecting the dressing of wounds, it will be seen that, in a limited way, and, without its prescribed precautions, antiseptic treatment has been used. Cleansing

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an accident wound, or washing an operation cut, with carbolic acid lotion has been the rule; whilst, over the immediate dressing of lint charged with carbolic oil, a covering of cotton-wool has served the purpose of protection and warmth-giving; but it is doubtful if it has assisted much in preventing contamination, as most of the cases of compound fracture have convalesced without its use. With these measures, my antiseptic treatment ends; and I have the strongest belief that success in the management of operation and other wounds is chiefly, if not entirely, ensured by extreme care and gentleness in the manipulation of the parts, by rigid maintenance of rest, and by providing free exit for all kinds of discharge. Thus, I hold that results quite as favourable as the best which are claimed for antiseptic treatment, can be obtained by a plan of management which is so simple, that the means for carrying it out are always at hand, and are thus available for any emergency.

f. Finally, I state that, with the exercise of proper care and supervision, patients do as well in a large hospital as anywhere else, and, in proof of this, I refer to the table which accompanies this communication.

SOME PARTICULARS OF TREATMENT IN A CASE OF PNEUMOTHORAX.*

By DANIEL NOBLE, M.D., F.R.C.P.

MR. THOMAS W. is about forty years of age. From youth up to the age of thirty, he had exercised his powers, both mental and bodily, far beyond the limits of prudence; and, about the age in question, he naturally became the subject of nervous exhaustion, impaired digestion, and other cognate derangements of the system. After trying, for two or three years, relaxation of business-efforts and various changes of air and scene, with only transient advantage, he finally resolved to give up business altogether, to leave Manchester (where he had resided all his life), and to live in Blackpool, as the place from which he considered that he had always derived the greatest benefit.

Dwelling in that locality, and amusing himself with a garden, and with the management of his property, which, in no respect, gave him either trouble or anxiety, he, for some half-dozen years preceding last December, had had very fair and enjoyable health. He was unmarried, but had a sister with him as his companion and housekeeper. Once or twice a year, he was in the habit of calling upon me in Manchester to consult me for some trifling ailment; never, however, for any mischief involving the chest.

It was soon after midnight in the morning of the 16th of last December, that he awoke with an acute and violent pain in the right side, which continued for several hours. He had previously had symptoms of but a slight catarrhal affection, which he attributed to over-occupation in his garden. There had, by his own account, however, been no disturbance of the general health nor any failure in flesh or strength. By daybreak, the severity of the pain had abated, but there remained a dry troublesome cough, with some difficulty of breathing; thereupon, the aid of a respectable local practitioner was summoned, but with this gentleman he, for some reason or other, became dissatisfied, and gave him his dismissal.

It was on the 18th of the month, two or three days after the commencement of the attack, that I was telegraphed for early in the morning; it was evening, however, before I could go. On arrival at the patient's house in Blackpool, a little before seven, I found that he could not be prevailed upon to recall his previous medical attendant; but he urgently expressed the wish that I should myself take charge of him altogether. I let him see that this was impossible; and that, on account of the gravity of the case, he must have some one on the spot; telling him that, if required, I would come over again, and see him in consultation. Upon this representation, he named Dr. Hardman, of the place—a gentleman of whom I had already heard, as a young practitioner both of judgment and of skill. He was accordingly sent for; and, on his coming to the patient's house, we investigated the case and came to the conclusion that, with pleuritis, there was associated severe bronchitis, especially on the right side, in which region there was hardly any appreciable murmur of respiration; whilst, on the left, there was one that was dry and unusually loud. The percussion-sound was everywhere clear, and not strikingly abnormal in any part. Nauseating doses of antimony were prescribed; and, as I could not return home the same evening, I promised, on leaving him, to call early the following morning on my way to the railway station. I did so, and again met Dr. Hardman. Although we found the symptoms in some respects relieved, they were not so to the extent that I had anticipated; the ex-

pectoration was but scanty; the cough was almost continuous; and the respiration, though a little relieved, was hurried, short, and embarrassed. I may state here that the pulse was only about 90, and that throughout the case the variations were but slight. The temperature was never more than 102; more frequently, however, below that point. But I had to leave somewhat hastily, so as to catch the train, and went away alike dissatisfied with the case and with the diagnosis that had been made.

Four days afterwards, on the 23rd December, I was again sent for, and went in the evening as before. On meeting my associate in the case, he at once observed: "I think you will find something more the matter than we thought;" whereupon, having given much consideration to the subject in the interval, I said: "Do you think there is pneumothorax?" (for this had occurred to me); he answered "Yes." And, certainly, on completing a re-examination, no other conclusion was admissible. The embarrassment of breathing had much increased; there was unintermittingly a dry irritating cough; no respiratory murmur whatever could be detected on the right side, yet there was an undue resonance on percussion; whilst the left afforded a loud so-called *puerile* murmur of respiration. To complete the evidence, it was obvious, on applying the stethoscope to the right infrascapular region, that there was "metallic tinkling," and also the sound denominated "amphoric."

Dr. Hardman told me that, since my previous visit, whenever, in consequence of symptoms of exhaustion, nutrients and stimulants had been pushed and antimony coincidentally withdrawn, he had found the dyspnoea sensibly aggravated—a result which he attributed, rightly I think, to the increased force with which, under these circumstances, the column of blood was thrown from the right side of the heart upon the restricted lung-space. Of course, as things stood, we were led to take a very grave view of the case. However, we agreed, in accordance with the view just expressed, to limit the food-supplies to fluids and simple diluents, and to maintain the administration of antimony in doses slightly nauseating. The patient, on the following morning, was again seen; and, probably, there was some slight relief to the more urgent symptoms.

My next visit was on the 30th of the same month, but I had had letters in the interval giving me a very gloomy view of the case; the dyspnoea, with all but sleepless nights from the irritating cough, continuing on the whole to increase. On arriving in the evening of the date just given, I found the patient literally in both bodily and mental anguish—almost gasping for breath in a state of hysteric excitement. There was immense pressure on the left lung, and considerable displacement of the heart, which had its systolic impulse enormously increased, thereby creating a distress that was simply intolerable. Indeed, the patient was plainly on the verge of suffocation, unless something were done to avert it. It was in these circumstances that I proposed to Dr. Hardman that we should liberate the air from the right pleural cavity, as it was obviously threatening life by its mechanical effects. In fact, at this time an unmistakable expansion of the thoracic parietes on the affected side showed itself; and this we verified by careful measurement. I was glad to find that my colleague had possession of instruments suitable for our purpose, and that he was quite confident of his manual dexterity in the use of them. Accordingly, after explaining matters to the patient and relatives about him, we got into order the so-called "aspirator;" and a trocar, with cannula of small bore, was pushed through the intercostal space between (I think) the fourth and fifth ribs; hereupon, the trocar being withdrawn, air at once rushed out, and, to expedite the process and to render it more complete, the aspirator was affixed, and a continuous pumping was kept up for many minutes. The relief was very speedy and unmistakable. There issued no serous fluid—only air. After withdrawal of the instrumental apparatus, the patient breathed with some comfort, the violent pulsation of the heart abated, and, after administration of an opiate, he became calm, and, during the night, had some refreshing sleep. On calling as usual in the morning on my way to the train, I experienced a great sense of relief when I found that he was alive.

As a result apparently of the benefit thus obtained, the patient's confidence in the resources of our art became unlimited; and he supplicated that I would, for a-while, come every evening; I agreed to repeat my visits as often as practicable, and, two days later, again went over to see him; to find, however, that the more serious symptoms were gradually returning. I will not unduly extend this paper by adducing details that have no special or peculiar interest. I will just state that, after seeing him two or three days consecutively, only to find matters worse, I proposed, on being unable to attend so continuously, that the aid of Dr. Hammond, of Preston, should be solicited; saying that I would introduce this gentleman to the case, and that, being nearer, he would be well able to come over in the intervals of my own attendance. This proposal was accepted; and, on the 6th of January of the present

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