bacilli, apparently *B. coli*. The purulent material from the Fallopian tubes showed very numerous streptococci, mostly in pairs and short chains, together with large numbers of desquamated epithelial cells and mononucleated leucocytes, there being almost no polymorphs present. Films made from the uterine mucous membrane showed numerous streptococci mixed with various bacilli. The spleen showed plugs of streptococci and *B. coli* in the small arteries, and the pulp was intensely congested, with numerous haemorrhages. Intense cloudy swelling was found in the liver, kidneys, and pancreas. The changes in the bone marrow were very interesting. Its naked-eye appearances have already been described. Sections of the rib marrow showed extraordinary congestion and large areas of haemorrhage, some quite recent, and others showing nothing but fine granular material with here and there the faint outlines of disintegrating red blood corpuscles, or a fine network of fibrin. There were crowds of streptococci both in the vessels and in the tissue, the fat cells being completely absorbed. Very few granular myelocytes and erythroblasts were seen, most of the cells found scattered among the red blood corpuscles closely resembling lymphocytes in appearance, though in all probability they were earlier cells of the leucocyte-forming series in which granules had not yet appeared, maturation of these cells being prevented by the intense action of the bacterial toxins present. No eosinophile cells could be found. In the marrow of the long bones similar changes were found. The fat was almost entirely absorbed, a sort of acute gelatinous degeneration resulting. Large areas of necrosis were found surrounding groups of streptococci, which were present both free in the tissues and plugging up the vessels. Throughout the whole marrow there were very numerous enlarged endothelial cells, some of them forming a sort of branching plasmodial network of very actively phagocytic cells filled with the remains of red corpuscles and blood pigment.

The case, therefore, appears to be one of acute streptococcal septicaemia, the presence of the *Bacillus coli* being probably a terminal phenomenon. Though the source of infection may have been the throat or intestine, I am inclined to think that the condition of the uterus and Fallopian tubes pointed rather to these organs being the origin of the bacterial invasion, and that the case may be regarded as one of "menstrual septicaemia," precisely analogous to puerperal septicaemia, and due to infection occurring in a somewhat delicate girl during the menstrual period.

The scarcity of polymorphonuclear cells in the various inflammatory lesions is interesting, and is accounted for by the degenerative changes in the bone marrow brought about by the extreme virulence of the streptococci causing the septicaemia. Another point of interest is the occurrence of swelling of the parotid gland, which was regarded clinically as being the cause of, rather than as one of the results of, the septicaemia, the latter view being in all probability the correct one.

A CONSIDERATION OF SOME OF THE FACTORS WHICH CONTRIBUTE TO SUCCESS IN ABDOMINAL OPERATIONS.*

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I HAVE been interested in abdominal and pelvic surgery for the past twelve years, and have been operating and assisting at operations during this time, and have also witnessed a great number of operations at home and abroad. As is but natural, I have formed certain opinions as the result of my observations as to the chief desiderata in abdominal surgery, and it is with some of these I propose to occupy a short space of your time to-night.

SELECTION OF CASES.

It is obvious that a surgeon who will only operate upon selected cases will, other things being equal, obtain better results than the man who operates upon each case as it comes. On this account it is difficult to compare operators one with another. One will accept risks which another will decline, and so mere statistics are of little value as a criterion of surgical merit. It is only by direct observation that a man's work can be judged.

Old people in my experience bear abdominal operations well, provided the duration of their performance is not too long. Cases of malignant disease stand in a class by themselves, and are always attended with greater risks. The mortality amongst them is proportionately much

higher than in non-malignant cases. Operation upon them often has to be very free, involving all organs, glands, and tissues that have been actually or probably invaded by the cancer cells. The subjects of malignant disease are often debilitated, aged, septic, and broken down with pain and long suffering. They therefore need especial care.

PREPARATION.

Most patients previous to operation are in a state of nervous tension and impressionable mental condition. Therefore, every influence about them should be optimistic. Nurses should refrain from discussing similar or any operations with their patients. Too many nurses in my experience forget that, though speech is silver, silence is gold. As little as possible of the preparations for operation should be subjected to the view of the patient.

The question of the best anaesthetic to be employed is too large to be entered on here. If there is any suspicion of bronchial trouble I ask that chloroform may be used. That anaesthetic is generally to be preferred to which the anaesthetist is most accustomed. It is well to give the anaesthetist a free hand. The surgeon has his own hands sufficiently full without having to concern himself with the administration of the anaesthetic. It is important, however, to him that complete relaxation of the abdominal muscles should be maintained throughout.

Oral asepsis must previous to operation receive careful attention. Carious teeth and purulent gums are often productive of toxæmic symptoms, and parotitis and parotid abscess are not the least of the troubles that may be caused thereby. It may be necessary to requisition the services of the dentist, though patients often resent this with unusual vigour. At all events, the nurses cannot be too assiduous in their endeavours to keep the buccal cavity in a clean and healthy condition.

Before operation the skin area prepared by compresses is, according to my view, not always large enough. The course of operations, like that of true love, does not always run smooth. Emergencies arise, more handling of the patient becomes necessary than was anticipated; therefore let a large area be prepared. The same applies to the preparation of the skin when the patient is actually on the operating table. I generally cleanse with (1) ethereal soap, (2) methylated spirit, and finally 1 in 2,000 biniodide in spirit, using all three freely—groins, loins, lower ribs, and pubes being included.

Patients should not be kept too long in hospital before being operated upon. Their valour certainly goes, "it oozes out of the palms of their hands," as it did, if you remember, in the case of Bob Acres in the *Rivals*. A week in the wards is often too much for them, and they leave the hospital unhappy and unoperated upon, the tension having become insupportable. On the other hand, no patient with an inflammatory condition and high temperature should be operated upon, unless it is an urgency case, for a few days after admission. So often the temperature of 103° becomes in a few days three or four degrees less with rest and treatment, when operation can be more safely undertaken. Whenever possible, peritonitis should be given a chance to subside before the commencement of surgical procedures.

I have noticed that patients are often subjected to too cold an atmosphere before entering the operating room. Warmth, and a continuous high degree of it, is essential from the moment the patient leaves his or her bed until returned to it. The anaesthetizing room should be as warm as the theatre. The operating table should contain hot-water apparatus. It is a mistake, in my opinion, for patients to be returned into a general ward while intoxicated with the anaesthetic. It is an unnecessary and barbaric practice. To have an intoxicated, shouting, vomiting woman on one or both sides for some hours frightens and often completely upsets a nervous woman, quite unused to hospital life, and herself expecting to be operated upon in a day or two. I have seen this, and have been vexed and pained by it. The practice should be abandoned. As there is a "cooling room" for those who indulge in Turkish baths, so there should be, so to speak, a "cooling room" for people coming round after operation. They should not be let loose upon a peaceful ward until quiet. But this room, or any room for the reception of patients after operation, should be warm. If warmth is essential before operation it is doubly so afterwards.

* A paper read before Chelsea Clinical Society, April 16th.

Patients are often sent through draughty corridors, placed in cold lifts, put in wards with open windows, when "shocked," cold and clammy from the operating theatre. It is not always the ether that is the cause of the subsequent bronchitis, though the ether usually gets the blame. Remember, too, that the anaesthetizing apparatus should be disinfected between each case. Death has sometimes resulted from neglect of this precaution from septic bronchitis. To maintain an equable warmth and obviate shock the practice of wrapping the patient in cotton-wool, with the exception of the operation area, is excellent. I need not remind you that special warm wool surgical stockings are sold and that every nurse knows how to make a pneumonia jacket. Cotton-wool for thighs and arms may be useful in addition in severe cases. These warm things must not be parted with too hastily subsequently, but gradually discontinued. Patients like them, moreover, and find them comforting. Before operation patients should never be allowed to get too "low." No one should be more than three and a half hours on an empty stomach while waiting for operation. How often are all the patients to be operated upon in an afternoon prepared as if all would be operated upon simultaneously, whereas there is often a difference of two, three, or even more hours between the first and last case.

THE OPERATION.

With regard to the operation itself I consider asepsis, in its every minute detail, of superlative and paramount importance. Everyone who comes in contact with the patient should wear sterilized overalls. Boiled gloves are indispensable for nurses and assistants alike, as well as for the operator. In short, everything that can come near the patient should be sterilized, and by heat if possible. From every point of view thermal agencies are preferable to chemical in effecting asepsis. For this reason I always use silk, or thread, or something that I can see boiled myself, in preference to catgut or other material that I may have to take on trust. Marine sponges are not to be thought of for this reason. Armlets of indiarubber should be worn by both operator and assistant. I have often seen the surgically unclean arm of either or both come into contact with instruments or ligatures, in spite of the wearing of gloves. The armlets should reach to the sterilized overalls.

In respect of asepsis it may well be said, "Let him that thinketh he standeth take heed lest he fall"; one must for ever be on one's guard. I have known men who have written vubly on asepsis commit unwittingly glaring mistakes. Nurses, too, are very weak in this direction. It is not an uncommon experience to go to a surgical home taking gloves with one for the chief nurses, and to find them subsequently, while still wearing their gloves, prepared to touch all and sundry articles, sterilized or unsterilized, such as taps, jugs, bedding, and the like; some of them think nothing of opening or shutting a door or window in them. All should remember that there is no more perishable article, in an aseptic sense, than one that has been sterilized. Almost "a breath can mar it." It will be said, "Oh, yes, but all this is not necessary; excellent results can be and are obtained without all this fuss every day." To this I would reply: Many a cranky ship has crossed the Atlantic in safety times and again, but who of us would not prefer to make the voyage in a ship of the highest class notwithstanding this fact? Our patients entrust their lives to us, and it is nothing less than treachery on our part if we betray that trust by carelessly neglecting to eliminate every possible risk.

As to details in operating, I have not time to discuss them. Personally, I very rarely employ drainage unless cutting down directly upon an abscess for the mere purpose of draining it. I have often left large areas of pyogenic membrane, that I could not remove, in the abdominal cavity without the slightest ill result; sometimes I have merely swabbed it carefully, at others copiously irrigated. "Clean well and close well" is my motto. In exploratory incisions more than one is greatly to be feared. A foolish prejudice, perhaps, but my own. An incision in one place to find nothing, and then another somewhere else, possibly with like result, is inartistic to say the least of it, if not dangerous, and says little for our diagnosis. Large incisions are now the fashion, and rightly so. Sewing up the abdominal wall in its various layers has robbed ventral hernia of its terrors. We

now rarely see it except in some cases where drainage has been employed. The length of an incision is unimportant; it is as well to see as to feel what one is doing, and easier to work through a large hole than a small one. An incision that only admits two fingers generally has to be enlarged before what is necessary can be accomplished. Free incisions and the Trendelenburg position when necessary commend themselves to me.

Lightness of touch and gentleness are all-important. Some excellent surgeons whose technique is perfect and skill of the highest order, yet fail in obtaining the best results. Such often have strong heavy hands, and use them with a strength that is detrimental to delicate tissues. It is the oft-handled bruised tissues that succumb to toxæmic attack, not the gently touched, briefly exposed and unchilled. No man with heavy hands can lay claim to good horsemanship. If "fine hands" are essential to a horseman, how much more are they to a surgeon!

If there is one thing I believe in it is rapidity in operating. A rapid operator can almost afford a little laxity in aseptic technique, though I say this under my breath. It is customary to say, "The rapid operating of Fergusson would be out of place to-day; with anaesthesia we can operate at our leisure." Not at all; every minute is of value now as it was then. Not a second should be lost from first to last. Be ready to make your incision the moment the anaesthetist gives the word. A harassing complication, such as one involving a resection of gut, may occur at any moment, when the man with time in hand will score heavily. Surgery is a game we play against Death. We play to win of course, and must not give away a single point in the game. Time is on the side of Death, not on ours. Every operation should be completed within an hour if possible. At the end of that time I should like a bell to be tolled continuously or other means taken to remind the operator that he was within the danger zone. I say this deliberately. Most patients can stand an hour well, but after that every additional five minutes is fraught with more and more risk. All seems to be going well when the heart stops and it is all over. A *post-mortem* examination may be made, and the heart is found weak and fatty, kidneys diseased, and a thousand other causes discovered sufficient to account for death, but in my opinion if the operation had been completed within twenty or thirty minutes nothing would ever have been said or heard about heart failure or renal inadequacy. One is so apt to dawdle over an interesting case, and go on doing this and that to embellish the operation and make it perfect in neatness and completeness; but while we are thus attending to local conditions the constitutional powers are being exhausted, and the sands of life itself fast running out. While we are fiddling Rome is burning! If there is much hæmorrhage, then there is the more need for haste. A long operation, with considerable hæmorrhage is a deadly risk to any patient, and to the old especially. After long operations every precaution must be taken to keep up warmth and the circulation. Hypodermic, rectal, and saline injections all have their place. In my opinion, direct intravenous saline injections are unrivalled by other methods, but it needs a little skill and practice to quickly dissect out the vein and transfuse into it, whereas anyone can administer a rectal or subcutaneous injection.

Many assistants at an operation are so many additional sources of risk. At some general hospitals I have seen three or four dressers assisting the operator at an abdominal operation, in addition to the house-surgeon, each one holding a retractor, or forceps, or other little tool, and between whiles not knowing where to put his hands—and we know from Dr. Watts who it is that "finds some mischief still for idle hands to do."

AFTER TREATMENT.

Rectal injections of normal saline are invaluable for relieving thirst, and may be repeated *ad libitum* at all times. If vomiting is troublesome, or shock pronounced, nutrient enemata are excellent to supplement or assist feeding by mouth. Patients suffer much from thirst. To withhold water is as cruel as needless. Any one who has ever suffered from extreme thirst will sympathise with the craving. There is none stronger.

Everything has become much simplified of late years in the after-treatment of these cases. Patients may be moved gently to a certain extent from side to side, and so be spared

that painful backache which otherwise is so distressing to them. A sixth or so now and then of morphine hypodermically, never does any harm, but more often it is not needed. Flatulent distension of the bowels is still the great trouble after coeliotomy. The rectal tube should be the nurse's *vade mecum* in these cases, and purgatives and rectal injections must be resorted to unremittingly, and sometimes in heroic doses, until the bowels act; after that patients may eat whatever they can.

I am quite convinced that not nearly enough attention is given to the culinary arrangements, either in hospitals or nursing homes. I have often been disgusted with the way in which the food is served to patients in hospitals. In the matter of surgical dressings and appliances nothing is too good for them. If members of the Royal Family they could not get better, but when it comes to the way in which their food is served to them, then it is another affair altogether.

Some years ago I was staying a few weeks in one of the chief towns in the South of Spain, and visited the military hospital there. The Commandant, a most courteous old colonel, showed me everything with the utmost kindness, but he explained to me that if I noticed many deficiencies it was because the Government would not supply them, and moreover the new methods had come in since his time, and he did not mind them much; but what he did think was really important was that the patients should be well fed, and so I was taken to the kitchens and was made to taste all the dishes, the soup and the wine, etc., and was asked my opinion of them. I pronounced them excellent, as undoubtedly they were. There are other things that make for success in surgery besides the latest type of sterilizer. After operations, when convalescing, the appetites of patients want coaxing and tempting, no matter how low the social class to which they belong. How often is the food sent away because it is served untemptingly, the meat cut too thick, or cold, underdone or overdone, or generally unappetizing! It is the same in a large percentage of the surgical homes. The commissariat is weak to the last degree, and the culinary art often almost unknown. Both the quality and quantity of the food supplied are inadequate, and complaints are heard on all sides. If, as Napoleon, said, "a soldier marches on his belly," certainly a patient convalesces on nothing else.

A certain most excellent teacher of surgery was always reminding us as students, when speaking of fractures, that we must restore the function of a broken limb and not be content with merely getting the ends to unite in good position. And so with abdominal work, we perform a big operation and turn the patient out of hospital in record time and are then a little vexed when he or she turns up again with as many aches as before. Do not forget that to some an abdominal operation and the subsequent convalescence has been a great ordeal and has taxed their powers exceedingly. It may take them three to six months to get back to where they were before and to be able to resume their usual occupations. Our work is not merely an exalted form of human carpentry. Surgery does not alone consist of manipulative dexterity and operative skill. Judgement, based on knowledge and experience, is still the master quality in our equipment, and many side issues have to be considered and disposed of by us before our patients are completely restored to health.

All I have said has I am aware been said, and said better, before. I have doubtless omitted many essential facts, but I have endeavoured to emphasize some of the points which in my judgement are important in abdominal and pelvic operations.

A CASE OF PRIMARY EPITHELIOMA OF THE VAGINA, SHOWING AUTOINOCULATION OR CONTACT INFECTION.

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THE interest of the question of autoinoculation in cancer lends interest to the following case:

Towards the end of September, 1906, Mrs. Mc., a healthy-looking, rather corpulent woman, aged 48, consulted me about

pruritus vulvae, which had been troubling her about three months, and it also came out that even before the itching began she had suffered from dyspareunia. She would not permit local examination, stating rather boastfully that she had always been healthy, and had borne 12 children without the assistance of a doctor, and all she wanted was some ointment for the itching. I gave her some carbolic ointment, and also a lotion of creolin and camphor, but she came back again three weeks later to be examined, as her condition had not improved. A swelling was found slightly ulcerated on the surface, and about the size of half a crown, just at the entrance to the vagina on the left side. On the other side more anterior and extending backwards into the vagina there was a larger ulcerated patch, with rough granular surface and raised edges. There was also a little discharge, which had an offensive odour. The inguinal glands were not enlarged, and the urine was free from albumen and sugar.

The patient was persuaded to undergo an operation, and was admitted to the Alexander Hospital, Coatbridge. On November 4th the growths were excised. The temperature was never above 99.8° F., and the wounds were quite healed in six weeks from the date of operation. There is some contraction of the vaginal orifice, as one would expect, but so far there is no sign of recurrence, and a period of nearly seven months has elapsed.

Microscopical Examination of Tumours.

The tumours were sent to Dr. Teacher of Glasgow for examination, and his report is as follows: "The tumours are both epitheliomata of the squamous-celled type. That which is regarded (I think rightly) as the primary is more cellular and soft than the greater part of the other, which is more of the hard, warty type. Nevertheless they are essentially the same tumour, and I should think Dr. Wilson's theory that the younger is an inoculation across the vagina quite likely to be correct. The other alternative is development of two epitheliomata in one vulva at the same time, which is also possible but I should think less probable."

Primary cancer of the vagina seems to be a very rare condition. Roger Williams, in his data derived from patients under treatment at the chief London hospitals, shows that only 0.43 per cent. of all cancers in women are of vaginal origin. Gurli, from Vienna hospital experience, gives the percentage as 1.6. Of 7,498 female cancer deaths in Hamburg tabulated by Reiche (1900), only 29 were of the vagina, or 3.8 per cent.; and of Hecht's 4,507 cases, 50 were vaginal, or 1.1 per cent. Averaging these results, it may be said that less than 1 per cent. of all cancers in women are of vaginal origin. These figures do not favour the theory held so strongly by some that cancer is caused by irritation, for few parts of the body are more prone to all kinds of irritation than the vagina. According to Williams, prostitutes are less liable to vaginal cancer than other women, notwithstanding their great proclivity to venereal and syphilitic affections of these parts. With regard to the wearing of pessaries, only a few instances of association of cancer with this habit have been recorded (Meyer, Hegar, etc.), whereas the number of those who have worn these instruments for years must be enormous. Most cases arise long after the menopause (Serafini, Bernard, Williams), the decennium 50 to 60 being the period of maximum frequency. Hence it may be inferred that the origin of the disease has no direct connexion with the incidents of the reproductive life. This is borne out by the fact that nulliparae are as prone to the disease as multiparae; for, as Bernard's data show, one-fourth of those affected have never been pregnant.

In making the diagnosis of vaginal cancer it is necessary to remember that secondary cancer of this part is common, whereas primary cancer is rare; consequently neighbouring organs likely to originate the disease—uterus, rectum, bladder, etc.—must be specially examined. Cancer of the cervix uteri, which is so common, nearly always spreads to the vagina sooner or later. The same is true of sarcoma. The diagnosis has to be made from sarcoma, sloughing myomatous tumours, certain chronic inflammatory affections (Chamberlain, Prickett), various syphilitic and tuberculous lesions, some mycotic infections—for example, actinomycosis; several of these lesions are far more common here than cancer. Bilharzia of the vagina has also been met with (Williams).

It is easy to see how a case showing autoinoculation such as I have described might be mistaken for a soft chancre, which is frequently multiple. Large has met with a vaginal gumma that presented as a chronic tumour the size of an apple, which, after having resisted many remedies, was at last completely cured by extirpation.

The question of autoinoculation or contact infection is a very interesting one, but it is difficult to get any literature