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PREPARATION OF THE PATIENT FOR OPERATION.\*

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No deliberately planned operation should be undertaken without careful preparation. Exactly what steps should be taken to bring the patient to the operating table in the best possible condition there is more or less difference of opinion. Thinking that a free discussion of the views and customs of members of this society cannot fail to be of benefit, I bring this subject forward, not with the idea of attempting to crowd upon you my own views, but with the hope of provoking a frank and free discussion upon a subject of importance to every practitioner who is ever called upon to do any operation from that of amputation of a finger to that of extirpation of the stomach.

As has been so clearly pointed out by Dr. Roswell Park, the past few years have been zealously employed in learning how to prevent infection from without, it now becomes equally mandatory to learn how to prevent infection from within. It matters not how painstaking the mere technique of an operation is carried out, if the internal toilet is given stepmotherly attention there will be many needless failures, many complicated convalescences.

Before beginning the formal preparations it is important that as accurate a diagnosis be made of the lesion for which the operation is undertaken as the circumstances will permit. This includes the use of all the ordinary means of clinical diagnosis,—symptoms, physical signs, chemical, microscopical, and bacteriological research if there be any chance of their proving of use, and employment of all the instruments of precision which the thorough study of the case

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demand. If a preliminary examination under anesthesia promises to add anything material to the knowledge of the case, the anesthetic should not be withheld.

An accurate diagnosis may prove an operation uncalled for; it may prove it useless. Uncalled for it certainly is if it is not going to remove the symptoms for which the patient seeks relief; useless, and worse than useless, if the disease is of such a nature that a fatal termination is inevitable. This is often true of far-advanced malignant disease when there is no hope of permanent cure and no prospect of temporary relief. Another condition often better left unoperated upon is advanced peritoneal sepsis from appendicitis or other cause,—operation often hastening the necessarily fatal end. Too great readiness to use the knife in these two classes of cases has done much to produce on the part of the laity an unwholesome dread of all operations. With a good working chance of success it is one's duty to take advantage of that chance, but to be persuaded into operating upon these hopeless cases because of fear of criticism for overtimidness, or because of the lack of the moral strength to say "no," can only injure the operator personally and bring discredit and abuse upon all surgery.

A careful diagnosis of the lesion is also useful in that it gives an opportunity to correctly plan the steps of the operation in such a manner as to save time and prevent shock and loss of blood.

The diagnosis having been made and operation shown advisable, it is important to study the patient with the view of discovering any and every condition likely to militate against the best possible results. The ability to withstand shock should be considered. Steps should be taken to insure prompt repair of the wound, guarding equally against external and internal infection. Among the various dangers from within may be counted especially micro-organisms and toxic substances carried in the circulation.

To secure internal asepsis the first step is to eliminate all possible sources by which germs can gain entrance into the circulation. All pustular skin

diseases should, as far as possible, be removed. The tonsils and buccal cavity should be carefully inspected and if any disease is found it should be cured or at least the surfaces rendered as mildly septic as possible before doing any serious operative work, unless it be an operation of emergency, with which this paper does not deal. Nasal catarrh, bronchial catarrh, suppurative disease of the middle ear, urethral discharges, etc., should be given careful attention before operating. No major operation should be undertaken until any existing boil, felon, or other abscess is cured, unless delay of the operation will entail greater risks than will be engendered by the probable presence of septic germs in the circulation; always remembering that it is better for a patient to die of a disease for which the surgeon is not responsible than of preventable sepsis after an operation.

That all these danger elements can be eliminated in every case is not claimed, but that they should be taken into careful consideration and rendered as nearly inert as the conditions will permit are demands which only common prudence dictates. Absolute disinfection of all points from which internal infection may originate is not always possible, but disinfection as complete as can be done will minimize the danger.

Autoinfection from the presence of micro-organisms is only an accidental condition, not applying to even a majority of cases. Passing to the second danger which threatens operative cases, one is confronted by a danger common to all. Autotoxemia is so frequent, its sources of origin so numerous, often so difficult to recognize, and always so hard to control, that there is a temptation to shut one's eyes and trust to blind luck or Providence, according to the religious beliefs one happens to hold. There are the toxic substances dependent upon imperfect oxygenation in the lungs; those dependent upon defective hepatic and skin functions; those which may be retained in the economy because of renal insufficiency; those myriads of deadly toxins elaborated in the alimentary canal; and now come other claimants for our attention in the persons of the internal secretions of various organs and glands.

How best to meet all the requirements necessary to forestall against the dangers which arise from defective physiological function is beyond present knowledge. A few simple precautions can be taken, and an effort will be made to point out a few of the most palpable sources of toxemia and the suggested method of minimizing the quantity of toxines carried by the circulation.

The body is constantly forming and casting out toxic substances. As long as the excretion of these substances is approximately equal to their elaboration a state of equilibrium is maintained. In normal physiological activity the elimination by skin, lungs, bowels, and kidneys prevents the accumulation in the circulation of a poisonous dose of these harmful products. After an operation without careful preparation all this is changed. Elimination is at a minimum. The same quantity of toxines, innocuous under normal conditions, will now produce toxemia. To guard against this evil it is necessary to forearm (1) by eliminating beforehand, as far as possible, toxines; (2) by discouraging the elaboration of more toxines; (3) by maintaining after the operation as normal a condition of the emunctories as the conditions will permit.

Any irregularities of digestion can be much better corrected before than after the operation. The convalescent from a surgical operation is often kept back and fails to gain strength because of gastric disturbances which might have been corrected beforehand. The same is true of the hepatic functions, any catarrh of the biliary passages, etc.

The skin should receive careful attention and the urine should be examined with the most painstaking care. The quantity of water and solids for the twenty-four hours must be accurately measured, and if it departs much from the normal in either direction an effort made to correct the defect before entering upon the steps of the preparation which immediately precede the operation. Among the solids of the urine which are likely to be especial causes of trouble if not eliminated in normal quantity may be mentioned the

salts of potassium and the coloring matters. Recent experiments have shown that the coloring matter represents about one-half of the total toxicity. On the other hand, urea was found to be much more innocuous than has been supposed, the potassium salts being several times more toxic. A pale urine, therefore, or a urine containing less than seventy or eighty grains of the potassium salts in twenty-four hours, should be viewed with suspicion.

Suppose, now, an operation has been decided upon and the heart, lungs, and emunctories are found to be in a fairly normal condition, I am in the habit of putting the patient upon about the following treatment for the two or three days preceding the operation:

The second evening before the operation calomel and soda are administered, either in one dose or in several divided doses. On the following morning Rochelle or Epsom salts are given in dram doses every hour until thorough purgation is secured. If an especially empty condition of the alimentary canal is desired, as in gastric and intestinal work, the purgation is usually begun the third evening before the operation, but this is not usually necessary, and should be avoided when possible, since it undoubtedly lessens the patient's ability to withstand shock. The evening before, if the operation is to be in the morning, and in the morning if the operation is to occur in the afternoon, a copious enema is given, in order to insure thorough emptying of the large intestine. The practice of giving an enema immediately before operating is not followed. It is not approved in any case, but is especially to be condemned when the operation is about the vagina or rectum. To have the bowels move while operating in this locality is not only unpleasant, but may cause fatal sepsis.

The use of the various intestinal antiseptics is not practiced much, because of (1) a feeling of skepticism about their doing much good and (2) disinclination to add to the number of drugs ingested on account of their tendency to derange digestion.

For the two or three days preceding the operation the patient is put upon a good, nutritious liquid diet.

This, in conjunction with the purgation, insures a reasonably empty stomach and intestine, and the less material in the gastro-intestinal canal the less toxins will be formed and the dangers of autotoxemia will be by this much diminished.

A general warm bath daily for two or three days before operation not only assists asepsis by making the body clean, but promotes cutaneous activity. If the patient is weak and toneless each bath should be followed by an alcohol rub.

The patient should also, during the days of preparation, be urged to drink large quantities of water. This not only increases the volume of the urine and thus causes it to carry away a larger quantity of the urinary solids before the operation, but increases the quantity of the urine for a day or two following the operation, and I believe in this way guards the kidneys from some of the unfortunate results which occasionally follow the administration of anesthetics. It also prevents to a great degree the distressing thirst to which patients are so subject the first few hours after an operation, while the stomach is not yet in a condition to safely bear liquids. The use of a rectal enema at the close of an operation also contributes to the same result and is good routine practice.

An antiseptic mouth wash used frequently during the preceding one or two days, mandatory when the operation is about the oral cavity, is undoubtedly a valuable expedient as a preventative of inspiration pneumonia and bronchitis, usually, if not always, germicidal in origin, the irritation of the anesthetic lowering the resisting power of the bronchial mucous membrane. The mask provided for administration of the anesthetic should also be aseptic, and a new one should be at hand in case of soiling from vomiting or spitting

For two or three days before the operation sulphate of strychnia, in doses of 1-30 to 1-20 gr., should be given three or four times daily. This drug does much to reinforce the heart and respiratory muscles and will forearm the patient against undue shock. Strychnia also serves a useful purpose before all celioto-

mies. Distention of the bowels by gas is one of the most distressing, not to say dangerous, post-operative symptoms in this class of cases. During the past two and one-half years I have made use of strychnia as a routine practice before all operations and have very rarely had a case suffer from inability to pass gas. Strychnia, with the property of increasing the tone and power of the muscular fibers of the intestines, as well as of the muscles of the abdominal wall, causes gas to be forced onward as soon as formed. It is fair to say that in all celiotomies, and other cases in which there is much depression, the use of the drug is continued after the operation.

Preparation of the field of operation will, of course, depend upon the condition present and the location. I direct the nurse to shave and scrub with soap and water, using a firm, but not too stiff, brush, not only the field of operation, but a large surrounding area. After this procedure a poultice of soft soap is applied and covered with rubber tissue or waxed paper. This should be done twelve to eighteen hours before the proposed operation. After remaining on several hours the soap poultice is removed and the field re-scrubbed as carefully as before. By this means the superficial epithelial cells, with whatever germs they contain (*bacillus epidermidis albus*), are removed. Washing with ether follows to dissolve away all fat. Next a large compress of gauze wet in 1-2000 bichloride solution is laid over the field, covered with rubber tissue, and bound on. This compress remains on until the patient is under the influence of the anesthetic. It is then removed, a final scrubbing administered, and the field washed with alcohol. Alcohol is used not so much as an antiseptic agent as for its properties as a hardening agent, imprisoning, so to speak, any germs which may perchance remain.

Variations from these steps are made use of according to the site of operation. For example, if the stomach or upper intestinal canal is to be involved in the operation, in addition to the procedures already mentioned, the stomach is washed out with boric acid solution or Thiersch's solution just before beginning the anesthesia.

If the female genitalia or bladder are to be operated upon a creolin douche is given three times daily during the days of preparation. The final douche should be given immediately preceding the anesthesia. After being brought under the anesthetic the vulva and vagina are thoroughly scrubbed with soap and water, followed by bichloride and alcohol, a gauze sponge held by forceps being used for the vagina instead of a brush.

Should an abdominal hysterectomy be contemplated, after the preparation of the vagina as just given, the uterus should be curetted, washed out, swabbed with carbolic acid and iodine, and packed with iodoform gauze. I know of no greater menace to infection, when the body of the uterus is removed and a part of the cervix left, than that from the cervical canal, the infection being carried by the blades of the scissors while cutting away the body. It is only by this careful preparation that infection from this source can be reduced to a minimum.

I do not approve of a long period of preparation. From the time the formal preparation is begun until the hour of operation it can be laid down as a truism that, with rare exceptions, the patient will not thrive. One is not likely to appreciate the dread, the anxiety, the fear which many patients experience from the hour an operation is decided upon. Digestion under such circumstances cannot be normal; there is a severe nerve strain, and deterioration in the condition is constant and sure. Therefore I do not agree with those who prefer to have the patient in hospital a week or more before the operation "in order that he may become familiar with his surroundings." All the formal steps needed after any existing complications have been cared for can be carried out in two or three days' time, and, as a rule, every day added is a distinct loss. During these days, as far as possible, rest to body and mind should be secured. The surroundings should be cheerful, but in spite of our best efforts in this direction the sensitive patient will suffer keenly during the days of preparation.