believes that this disappearance is due to its lipoid solubility. This belief is based on the fact that in the test-tube lysozyme is absorbed quantitatively by anhydrous lecithin and cannot be recovered from the lecithin by repeated washings with salt solution. If the anhydrous lecithin-lysozyme complex is dissolved by absolute methyl alcohol, however, the lysozyme can be recovered quantitatively from the undissolved salt residue.

Whether or not lysozyme is synthesized in the animal body, or, like certain vitamins, is a nutritional factor conserved by the animal tissues, has not yet been determined. Egg white, for example, contains about 0.01 milligram lysozyme per cubic centimeter. Egg yolk contains many hundred times this concentration. Many vegetables are also natural sources of this protein antiseptic.

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POSTOPERATIVE TREATMENT IN PERITONITIS

This discussion is intended to apply to generalized peritonitis and not to localized intraperitoneal abscesses. After the most gentle and, usually, the most conservative operative intervention designed to remove or stop the source of contamination of the peritoneal cavity has been carried out, the surgeon is confronted with the equally important postoperative care. Much has been learned in recent years in clinical practice and the many advances which have been made in biochemistry, physiology and metabolism are applicable to this problem. In peritonitis the absorption from multiple partial obstruction due to intestinal distention is a greater lethal factor than the infection directly. It logically follows that the prevention of distention is of great importance. The campaign to this end must be started immediately after the operation.

The first step in this fight is to place a nasal duodenal tube into the stomach and connect it with a Connell suction. This should be done immediately after operation, and continued until the patient is passing gas per rectum freely without colon flushes or enemata. The importance of constant lavage of the stomach and draining off the regurgitated upper intestinal contents is urgent. In this connection it is to be remembered that over 70 per cent of the gas causing distention of the gastro-intestinal tract is swallowed air as a result of attempts on the part of the patient to belch. The tube in the stomach, with constant suction, eliminates this big factor and the collapsed stomach allows more room within the abdomen for the coils of distended gut, decreasing the degree of obstruction at points of angulation of the different loops. The upper loops can empty into the stomach making further room for the lower loops to empty upward.

The intestines are vitally involved in the inflammatory process, and the principle of providing rest for such sick or injured tissue should be strictly followed. Hot compresses to the abdomen, when properly applied and not allowed to get cold, make for comfort and probably have some beneficial effect in keeping up the muscle tone of the intestines without artificially stimulating peristalsis. Morphin given in adequate doses for comfort, but not to excess, has been shown experimentally to aid in the maintaining of normal muscle tone of the intestines. The use of eserin, pituitrin, petressin, concentrated saline, etc., to whip up the sick, distended intestines is most definitely injurious. One may secure the expulsion of gas by these drastic drugs in conjunction with flushes and enemata, but more often than not, a few hours later, the patient is more distended than ever. The pernicious practice of routine colon flushes, rectal drips and early enemas are contra-indicated. A low colon flush or small enema is of assistance only after natural peristalsis has been definitely reëstablished, but not before. A rectal tube may be inserted twice or three times daily after the first twenty-four hours, and this should be the limit of meddling with the gastro-intestinal tract until peristalsis is active. Early high colon flushes or high enemata are practically as harmful in peritonitis as early feeding by mouth, which is agreed to be detrimental. Rectal instillations cause reverse peristalsis and stirs up the pus.

In brief, the surgeon should use all agencies at his command to put the gastro-intestinal tract completely at rest until nature is ready for assistance. When the patient is ready for help a low enema of three hundred cubic centimeters is preferable to the so-called high enemata. The desire to defecate is caused by a sudden distention of the rectum and the painful contractions due to over-distention of the bowel higher up serves no useful purpose and in peritonitis does harm.

Having outlined the campaign for rest of the sick guts, the next essential is to supply fluid, salt and nourishment in the proper quantity. A sick patient with peritonitis loses from 1,500 to 2,500 cubic centimeters of fluid in each twenty-four hours by evaporation from the skin and in the expired air. This evaporation has first call on the available fluids possessed by the patient's tissues. For sick patients to adequately free the body of nitrogenous waste products, there must be excreted at least one thousand cubic centimeters of urine daily.

Thus three thousand to 3,500 cubic centimeters of fluid is required in each twenty-four hours. Patients who have peritonitis most often are emergency cases and are often dehydrated. Coller[1] and his collaborators have shown that to overcome such dehydration 3,500 cubic centimeters of fluid is required to be able to start from scratch. This seven thousand cubic centimeters of required fluid is a startling amount for the first twenty-four hours, and in most instances would be dangerous. Each case must be individualized, and it is not necessary to give all of the seven thousand cubic centimeters in the first twenty-four hours. Yet more often than not, the patient does not get enough fluid which should be given in an adequate quantity but at a slow rate of speed.

From clinical experience and physiological facts, we know the above to be the required volume of

[1] Coller, Fred A.: Water Balance in Surgery, J. A. M. A., Vol. 108, No. 1 (Jan. 2), 1937.

fluid, but the kind of fluid, the amount and kind of salt, and the amount of sugar are of equal importance. Since the stomach is being constantly emptied, there is a complete loss of the chlorides secreted as hydrochloric acid in the gastric juice. These chlorides must be replaced. This can be done in the form of normal saline or Ringer's Solution. However, the patient must not receive too much sodium or his kidneys may cease to function, and he will develop edema, suppression of urine and uremia and die, not as the result of the pus in the peritoneal cavity nor to the toxic absorption from loops of obstructed gut, but a chemical death as a result of his treatment. Six to eight grams of sodium chlorid is the requirement of the average individual in normal health in each twenty-four hours. One thousand cubic centimeters of saline or Ringer's Solution will supply nine grams, which is adequate for twenty-four hours. Ringer's Solution, because of the calcium and potassium it contains, is preferable to sodium chlorid solution. If edema develops because of too much sodium, and kidneys of different people vary in their ability to cope with an excess of this element, it can be corrected by the addition of five cubic centimeters 10 per cent calcium chlorid to one of the glucose intravenous injections.

The calcium chlorid corrects the beginning alkalosis and has a remarkable effect by increasing the volume of urine and reducing the edema. The writer has used calcium chlorid in this manner for fifteen years and with gratifying results.

To prevent the development of acidosis, a sufficient amount of carbohydrates must be supplied in a usable form to furnish glycogen for the liver, and to burn completely the products of katabolism of fats. This again varies, but 5 per cent or 10 per cent glucose solution may be used alternately as indicated to supply the demand.

The facts indicate the use of the following arbitrary routine. Give one thousand cubic centimeters 10 per cent glucose in distilled water at 8 a. m., one thousand cubic centimeters Ringer's Solution intramuscularly at 1 p. m.; one thousand cubic centimeters 5 per cent glucose in distilled water at 7 p. m., and allow the patient to rest until morning. If the patient's veins are good, all fluids may be given by the intravenous routine for the benefit of comfort. Each intravenous injection of one thousand cubic centimeters should require, at least, one and one-half hours to administer to prevent the occasional occurrence of pulmonary edema from this volume of fluid if given too rapidly. In the more desperate cases and those with poor veins, continuous intravenous administration of glucose by the drop method is a more satisfactory way of furnishing the required fluids. The rate of flow should be about forty drops per minute.

This régime for from four to seven days will carry the average patient with generalized peritonitis to the point where he can again take fluids and nourishment by mouth. However, in some of the more severe cases, this procedure may have to be carried out for two to three weeks. After ten days to two weeks, the patient may develop edema due to low blood serum protein. In medical centers where laboratory facilities are available, this fall in serum protein can be detected early by blood chemistry examinations which serve as an accurate guide for proper treatment. However, not all hospitals are equipped to furnish such adequate and reliable reports and, indeed, such reports are not obligatory. The only available method of furnishing the patient who cannot eat, the required serum protein is by giving blood transfusions. Therefore, in the absence of blood chemistry examinations as a guide, a transfusion of whole blood should be given as soon as the dependent edema and a decrease in the urinary output occurs and should be repeated as often as is necessary to control edema until the patient is able to take protein by mouth.

This régime has been arrived at after trial over a period of years of water by mouth, early feeding, rectal drips, rectal instillations, colon flushes, various enemata, pituitrin, eserin, etc., and is, productive of the best results.

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GLAUCOMA

With increase in longevity, a corresponding increase in the number of patients with simple glaucoma is to be expected. The importance of glaucoma in the practice of ophthalmology can be seen from the fact that, of the nineteen papers presented before the Section on Ophthalmology of the American Medical Association in 1936, three dealt with this subject.[1]

Glaucoma has been known from antiquity. Four centuries before Christ, Hippocrates mentioned the "glaucoses" as the known affections of advancing age. Of course, the knowledge he possessed was hazy, as he did not distinguish cataracts from eye conditions caused by increased intra-ocular pressure. The Greek and Latin writers who followed him learned one important fact, that there was a difference between the various eye conditions which took place behind the pupil and caused blindness. There were the "suffusions" which were favorable from the operative point of view, and the glaucomata which were unfavorable. Of course, it was the congestive variety that has been thus known, since the noncongestive (simple) variety can be diagnosed primarily by the ophthalmoscope. The name "glaucoma" is from the Greek word γλαύκωμα, derived from γλαυκός, meaning "sea-green or gray," and this condition was so called on account of the greenish reflex from the pupils in glaucoma.

Congestive glaucoma was usually regarded as having some connection with gout, and was called ophthalmia atritica. The noncongestive type was considered as produced by diseases of the deep structures of the eye, and with other kinds of blindness was known under the common name of

1 Weeks, W. W.: Ocular Hypertension in Glaucoma—Errors in Operative Technique Likely to Cause Failures in Operations for Its Control. Wheeler, J. M.: Iridectomy with Cyclodialysis for the Reduction of Ocular Tension. Barkan, O.: A New Operation for Chronic Glaucoma, Tr. Sect. Ophth., A. M. A., 1936.