

THE TECHNIQUE OF ANTISEPSIS AND ASEPSIS IN
GYNÆCOLOGICAL SURGERY.*

BY CHARLES GREENE CUMSTON, M.D.,

Assistant Professor of Surgical Pathology in the Faculty of Medicine of Tufts College, Boston; Honorary Member of the Surgical Society of Belgium; Fellow of the American Association of Obstetricians and Gynecologists; Corresponding Member of the Association of Genito-Urinary Surgeons of France, of the Gynecological and Obstetrical Society of Paris, of the Pathological Society of Brussels, etc.

In this short communication on the technique of antiseptis and asepsis, applied to gynæcological operations, we have not the intention of discussing the question in its relation to the improvements brought about in the operative technique nor the various methods employed to-day. Our object is simply to describe the methods that we have employed for about a year relating to the antiseptis and asepsis of the operator, his assistants and patients, in as concise a manner as possible. After this we will say a few words on suture material, antiseptic gauzes and dressings in general.

We believe, and it is our firm conviction, that asepsis *alone* can never give such brilliant results as when it is combined with an antiseptic technique, and for the last few years we have always employed the mixed method.

Regarding the operator and his assistants we must consider the four following points, namely: (1) the sterilization of the hands; (2) the care of the nails; (3) the use of gloves, either rubber or cotton, and (4) the preparation of the beard and hair. We would here remark that for no matter what operation in gynæcology, whether it be by the

* Read before the Congrès Périodique international de Gynécologie et d'Obstétrique, held at Amsterdam, August 8-12, 1899.

abdominal or the vaginal route, two assistants are quite sufficient; one of them helps us directly with the operation, while the second takes care of the sutures, sponges, instruments, etc. We usually allow the anæsthetic to be given by an experienced nurse. The fewer directly connected with an operation, the surer will be the asepsis.

Preparation of the Operator's and Assistants' Hands.—In the first place, the hands and the arms well above the elbows are thoroughly scrubbed with hot water and green soap for ten minutes, and during this time the water in the basin is changed four or five times. We wish to insist most particularly on this point that during the process of scrubbing the water should be frequently changed. We employ rather large, very cheap nail-brushes, which are sterilized for an hour before using them, and they are never used for any number of times. After scrubbing the hands and the forearms, they are washed thoroughly with ether; after this they are scrubbed in alcohol at 90° and afterwards in a $\frac{1}{1000}$ solution of sublimate. The sublimate is then removed by rinsing them in sterilized water. It is hardly necessary to add that the brushes used for scrubbing with alcohol and sublimate have been sterilized.

Regarding the care of the nails we can only repeat the very wise advice of Kocher and our former master, Kummer of Geneva, to keep them trimmed so short that no nail remains to be cleaned. We are convinced that if this precaution were taken many unfortunate results in the healing of wounds would be avoided, and on this question there are very few surgeons, even of wide experience, who consider it either theoretically or practically.

Regarding the *use of rubber or cotton gloves* during an operation we have little to say, excepting that in our practice we have practically given them up after having tried them. But their use is absolutely indicated when making vaginal or rectal examinations, or when a dressing is to be made on infected and septic wounds, or when operating for pus cases. In aseptic, plastic operations we occasionally wear cotton gloves, but this is done more for convenience than with a view to obtaining a more perfect asepsis. We feel very certain that even the most careful surgeon may, without knowing it, transport infected material coming from vaginal or other discharges, and that the simple washing of the hands does not remove this septic matter. Consequently for the past few months we wear rubber gloves during vaginal and rectal examinations, and we order them to be worn by the nurses who are caring for infected wounds or septic cases.

As to the *toilet of the beard and hair*, we believe that operators gen-

erally do not give it the attention it deserves, and according to our way of thinking many cases of post-operative infection may be attributed to an infection from the beard or hair during an operation. In order to avoid as much as possible this source of infection we wear a linen cap, to which is attached a small bag, which completely incloses our beard, mustache, and mouth. It is hardly necessary to say that these two objects have been sterilized along with the operating gowns.

Preparation of the Patient.—Since every operation performed by the abdomen may require some complementary operation on the vagina or on the cervix, all our patients are prepared as if they were to undergo a vaginal operation. The genital organs and the pubis are shaven with care. The vagina is then carefully washed with ethereal soap, after which all trace of the soap is removed by an abundant irrigation of sterilized hot water, and the toilet is completed by an irrigation of a $\frac{1}{2000}$ sublimate solution or with a $\frac{1}{3000}$ solution of citrate of silver. We never pack the vagina with antiseptic gauze preparatory to operating, as is advised by a certain number of authorities, particularly the French gynecologists.

The abdomen is treated as follows: It is first thoroughly scrubbed with ethereal soap, which is carefully removed by the free use of ether; a scrubbing with alcohol at 90° is followed by the application of a compress dipped in a solution of sublimate at $\frac{1}{3000}$, and the whole is kept in place by an abdominal binder. We have entirely given up the use of alcohol and ether in the cleaning of the vagina, because these two bodies have appeared to us to be far too irritating to the mucous membrane. When the patient is placed on the operating-table we repeat the same cleansing of the skin of the abdomen and the vagina.

We have always found it a useful practice to render the intestine in as antiseptic condition as possible, and we have used betanaphthol at the dose of 25 centigrams four times a day for four or five days before the operation. We think by this means that the virulence of the bacteria inhabiting the intestine is to a certain degree inhibited. When the urine is purulent we obtain a relative antisepsis of the genito-urinary tract by the administration of urotropin given at the dose of 50 centigrams four or five times a day, and this practice has certainly been of value, especially when a vaginal hysterectomy or an operation on the vagina or bladder is to be performed.

The day before the operation the bowel is emptied by calomel given at the dose of 3 centigrams every quarter of an hour until six doses have been taken, and the last dose is followed up two hours later by 20 grams of phosphate of soda.

We now come to the consideration of the sterilization of suture material and ligatures. For tying the large vessels we use a medium-sized twisted silk and never a braided silk, because the latter, we believe, is very subject to slip along the vessel-walls and consequently a post-operative hæmorrhage is to be feared. We prepare our silk by boiling it for a half an hour and from the water we place it in a $\frac{1}{2000}$ solution of lactate of silver, where it is left for one week. At the end of this time it is removed and placed in sterilized glass-jars, which are left in the sunlight for forty-eight hours. The action of the sunlight produces a chemical transformation in the lactate of silver, resulting in the formation of a layer of metallic silver on the outside of the silk. For suturing or tying off the broad ligament, and for all sutures used for plastic operations on the vagina, or for the buried sutures in the abdominal incision, we employ catgut prepared by formolin as follows: We select the best commercial catgut of only medium size, and after it has been wound on spools of suitable length, it is placed in a $\frac{1}{100}$ solution of formol for forty-eight hours. It is then removed and washed in running water for six hours. The spools are then dried and placed in a drawer. Then, before the operation, they are thrown into boiling water and allowed to boil for fifteen minutes, after which they are placed directly in absolute alcohol. For Emmet's operation or amputation of the cervix we prefer a fine chromicized catgut prepared according to Lister's method, and which is afterwards sterilized in a dry heat at 130° for one hour on two consecutive days. This fine chromicized gut holds very well for eight or nine days, which is a sufficiently long time to obtain a solid union of the operative wound.

For all other operations on the vagina, whether it be a plastic or anterior or posterior colpotomy, we employ the formol catgut, and if for any reason there should be an indication for a vaginal douche during convalescence an irrigation of a $\frac{1}{200}$ solution of formol will render the vagina antiseptic and at the same time will prevent the catgut from dissolving with too great a rapidity.

For the closing of the cutaneous incision and the subcutaneous cellular tissue, we employ an intradermic suture of formol catgut in the case of thin subjects in order to avoid the lower layers of the epidermis, which, as we know, contain the staphylococcus albus in considerable quantity and perhaps other organisms as well, which the most careful mechanical and antiseptic cleansing will fail to reach. But when the subcutaneous cellular tissue is very greatly developed we have given up the intradermic suture because it has appeared to us that union per primam is exceedingly difficult to realize in fat subjects

when this suture is used, and under these circumstances we employ an interrupted metallic suture, either with a wire made in Switzerland which is composed of a combination of aluminum and bronze, or else fine virgin silver wire. Both of these may be tied in a knot like silk and are very easy of manipulation. The silver wire is simply sterilized by boiling it with the instruments, but as the aluminium and bronze wire is rendered brittle by moist heat we sterilize it in a dry heat at 130° for an hour on two consecutive days.

Regarding antiseptic gauzes to be used for tamponing the vagina or other cavities, we employ certain bismuth salts exclusively, because they can be sterilized in steam without undergoing any chemical change, they are very weak in their toxic properties even when employed in large quantities, and, lastly, they are odorless. Iodoform or iodol gauze we only use in tubercular lesions. The three bismuth salts to which we give our preference and with which we have very largely experimented are xeroform (tribromophenate of bismuth), carbolate of bismuth, and subgallate of bismuth. Our antiseptic gauzes contain 20 per cent. of their weight of one or the other of these salts.

It must be said that in operative work we have very few occasions for the employment of these gauzes, excepting in cases of vaginal hysterectomy or when we wish to drain a pus cavity by Miculicz's method. We would say in closing this article that in order to obtain a thorough and antiseptic draining of collections of pus within the pelvis, the vaginal route in our opinion is very far superior to the abdominal route. We do not wish it to be understood that we consider vaginal hysterectomy the treatment of choice in dealing with pelvic suppuration in general, because we believe that posterior colpotomy is destined in the future to be employed both as a *conservative* and a *curative* intervention.

From the first of October, 1898, to the first of July, 1899, we have performed seventy-four gynæcological operations and we only have to report a single unsuccessful result, and still in this particular case we very much doubt if the complication which occurred was due to any fault in our antiseptic technique. We have performed eighteen abdominal laparotomies (it is understood that we are here only speaking of the laparotomies performed for lesions of the female genital organs), six of which were for fibroid tumors of the uterus, two for ovarian cystoma, and ten for inflammatory lesions of the adnexa. We have performed twenty-one posterior colpotomies, eleven times for suppurating peritonitis limited to the pelvis, four times for unilateral lesions of the adnexa, three times for emptying hæmatoceles, and three times for

the section of the utero-sacral ligaments, followed by Alexander's operation in cases of marked antifixion of the uterus combined with a retroversion of the organ. Five vaginal hysterectomies, according to Doyen's method, four of which were performed for epithelioma of the cervix, and once for a severe gonorrhœal metritis. Emmet's operation we have done fourteen times, and in nine instances this operation was followed by a plastic operation on the perinæum, on the anterior vaginal wall, or both. Nine curettements of the uterus for infections localized to this organ. Six Alexander's operation for simple, moveable retroversion, and one case of closing a vesico-vaginal fistula, completes our modest list of gynecological operations performed within the last nine months.

In all these operations, with one exception, every patient has had a perfect convalescence, and the operative result has been as nearly perfect as possible. The case presenting the complication referred to was that of the gonorrhœal metritis, in which the uterus was removed by vaginal hysterectomy after long and vain attempts to affect a cure. The clamps were removed in forty-eight hours, and the patient left the hospital eighteen days after the operation in a very satisfactory condition, excepting that she complained of some pain on the left side, which could not be accounted for by a careful digital examination. About four weeks after her discharge from the hospital we were sent for to see the patient, who had suddenly developed symptoms of a rather severe generalized peritonitis, due to the rupture of an abscess, which we think had formed in the left broad ligament. The patient was operated on by one of our colleagues through the abdomen, from which a very little serous pus was evacuated, a large quantity of thick mucopurulent pus being evacuated through the cicatrix into the vagina, and as far as we are aware the patient has since made a good recovery.

871 Beacon street, Boston.
