Ionisation in the Treatment of Certain Gynæcological Ailments.

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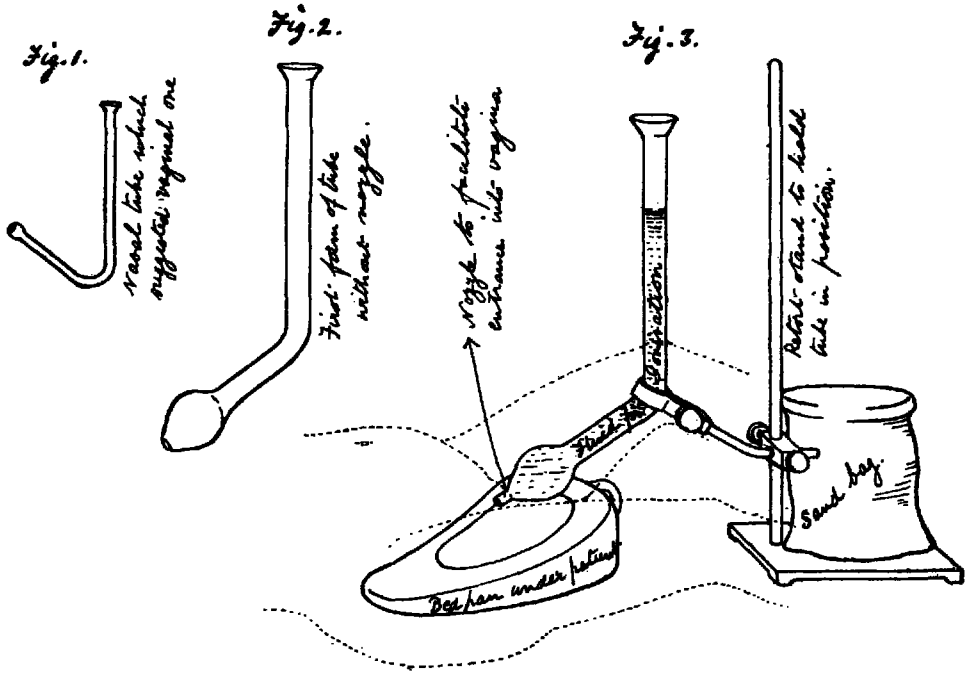
I propose to bring to your notice an improved method of treating some diseased conditions of the uterus and adnexa by electricity.

For many years French and American practitioners have used a variety of currents for treating these complaints and with good results. Apostoli treated fibroids with the galvanic current, and Bordier treated the same disease with X rays.



American practitioners favour static current for a great variety of uterine complaints of a congestive and spasmodic nature. The late Dr. Sloan of Glasgow, an earnest worker, varied the kind of current he used according to circumstances. I wish to discuss the use of the galvanic current in its action of ionisation and electrolysis. I got the idea for the apparatus I have devised, for carrying drugs into the parts affected with disease, from a U-shaped glass

nasal tube which is used for treating nasal catarrh (see Fig. 1). I had a larger one made for use in the vagina. Fig. 2 gives an idea of the shape of the first tube used for treatment. It is made of glass tubing one inch in diameter. The top is spun out to form a funnel two and a half inches across. The shaft, which is fourteen inches long to the angle and six inches to the bulb, spreads out to a diameter of two and a half inches, and ends in a hole three-quarters of an inch across. The angle is an obtuse one of one hundred and thirty-five degrees. In Fig. 3 it will be observed that there is a nozzle added to the orifice of the bulb, which makes the insertion easier and also keeps the vaginal wall away from the lumen of the tube.

The patient is placed on her back on a couch. A slipper bed pan placed underneath the buttocks raises the pelvis slightly, and collects the solution when the tube is withdrawn. The ball is vaselined and then pushed gently into the vagina till it fits fairly tightly. An adjustable retort-stand with a heavy base is then placed so as to allow the clamp to grip the tube and keep it in the position most comfortable to the patient. A bag of sand on the base holds the stand firm. After putting a pad wet with normal saline on the abdomen and a metal electrode over it, some of the solution to be used is poured into the glass tube. If the patient does not feel any leakage when the tube is partly full, the rest of the fluid, usually about twenty ounces, is poured in till there is a head of fluid in the tube about twelve inches high. The patient is then asked to cough. This often expels a large bubble of air imprisoned in the vagina, which if retained would insulate a part of its surface from the current. It also indicates whether the end of the tube is free in the vaginal cavity, or pressing against some part of the wall. This frequently happened when the first tube (see Fig. 2) was used, and a sore spot developed by the current impinging on the part opposite the hole in the tube. With the improved tube the weight of fluid balloons the vagina and keeps the wall away from the nozzle and at the same time smoothes out the vaginal rugæ so that the fluid bathes every part of it, which is especially necessary when treating a septic vaginitis. If when the patient coughs the fluid does not rise in the tube it shows that the tube is improperly inserted. If this cannot be rectified without losing much of the solution, it is best to remove the tube and then reinsert it. When all is in order a copper or zinc wire is placed in the solution in the tube corresponding to the reagent used in treatment. The solutions most frequently used in treating uterine, cervical and vaginal conditions, are zinc sulphate and copper sulphate (1 per cent.).

In cases of salpingitis a solution of potassium iodide, 1 per cent.,

with some tincture of iodine added till the colour corresponds to sherry, is the most satisfactory. The ion of iodine is the most penetrative of all, and travels into the tissues a long way in a short time. When everything is ready, the polarity of the current is determined; and if the solution to be used is one of copper, zinc or mercury, the wire in the tube is connected to the + pole; if potassium iodide and iodine the − pole. The current is now slowly turned on till about fifty mil. amps. are registered. The patient's sensation of pricking in the vagina and on the abdomen must be taken as a guide in regulating the dose of current. The vaginal membrane is very insensitive and will easily stand fifty mil. amps. The occurrence of abdominal pain when the current is turned on is a diagnostic sign of encysted pus, and if it occurs the ionization should at once be discontinued. The length of the interval between applications it depends on the reaction caused, which varies considerably. In some the applications are once a week; in most cases they can be given at three day intervals. Copper always causes more reaction than either zinc or iodine.

The following are illustrative cases:—

CASE 1.

Case of salpingitis. Mrs. A. (Dr. Good). Right salpingitis and ovaritis with some chronic appendicitis, also anterior crural neuritis. Dysmenorrhœa. Some menorrhagia. Neuritis causes most discomfort. Vaginal examination: an inflammatory mass could be felt to the right of the uterus, tender on pressure and causing pain radiating down the leg. The patient had ten applications with the glass tube and a solution of potassium iodide and iodine. The current used was at first twenty-five mil. amps. gradually increased to fifty, the whole application taking half an hour. There was no abdominal pain on turning on the current, indicating that there was no pus in the mass. This patient was distinctly better at the end of her course of treatment. All pain disappeared, the periods were more normal, there was no discharge and per vaginam the tumour could not be felt.

CASE 2.

Case of salpingitis. Miss B. (Mr. Hewetson). Left salpingitis. Gonorrhœa six months before. Had been curetted once. Had had vaccines, douches and tampons. Complained of pain in abdomen. The discharge was slight, gonococci could not be detected. Per vaginam: the left Fallopian tube was thickened but not very tender. There was tenderness all round the uterus. Treatment: The glass tube with copper sulphate solution 1 per cent. for the first five applications, followed by potassium iodide and iodine 1 per

cent. for the last five. The amount of current used and the length of time were the same as in the last case. This patient was well at the end of her course of treatment and I believe has remained so.

CASE 3.

Case of metritis and cellulitis. Mrs. C. (Mr. Hewetson). Chronic metritis and cellulitis after operation for retroversion. Pain at periods and when defæcating. Per vaginam the uterus is in good position but tender on being moved. There is thickening in the pouch of Douglas. Treatment: Glass tube with a solution of potassium iodide and iodine. Six applications with intervals of four days except when a period was on. The patient improved and has remained well.

CASE 4.

Case of salpingitis. Miss D. (Dr. Edge). Right salpingitis after operation for appendicitis and retroversion. Treatment: Glass tube with potassium iodide solution. Eight applications with no improvement. The failure in this case was probably due to the fact that the shunt rheostat on the milliampmeter controlling the ten to a hundred readings was out of order and the patient was only getting five mil. amps. instead of fifty.

CASE 5.

Case of salpingitis. Mrs. E. (Mr. Jordan). Salpingitis and inflammation of the cervical stump. Supravaginal hysterectomy had been performed for menorrhagia. There was slight hæmorrhage and pain at the time her periods should have come on. The chief discomfort complained of was abdominal pain from the salpingitis. Treatment: Glass tube with copper sulphate solution 1 per cent. was first applied for the endocervicitis. When this had improved after five applications potassium iodide and iodine solution was used. The pain and inflammation so much improved that the patient required only ten applications. I have since heard that she recently had the cervical stump removed for fear of malignant disease. At the operation no salpingitis was found.

CASE 6.

Case of salpingitis. Mrs. F. Dysmenorrhœa and bilateral salpingitis for eleven years. Commenced soon after her marriage and was no doubt of gonorrhœal origin. She had continual pain in her back and abdomen. She had no children. Had been treated with rest, douches and pessaries with no improvement. Treatment: Glass tube with potassium iodide and iodine solution. Eight applications with five day intervals, except at her periods. The dysmenorrhœa and backache disappeared and the mass of

inflammation on both sides subsided. Her medical attendant recently informed me that she was six months' pregnant.

CASE 7.

Case of salpingitis. Mrs. G. Salpingitis and dysmenorrhœa for years. One Fallopian tube had been removed. Had been curetted once and had had the cervix dilated. Per vaginam: a mass could be felt on one side of the uterus which was tender on palpation. Treatment: Copper sulphate solution 1 per cent. followed by potassium iodide solution. Great improvement followed the applications.

Electrolysis, like ionization, sets free various ions and carries them through the tissues, but the term is now used to indicate the breaking up of sodium chloride and other salts in the blood serum and using the ultimate chemical substance developed at the positive and negative electrodes for their local action on the tissue. Sodium chloride in the presence of a current is split up into its elements sodium and chlorine. The sodium ion travels towards the negative pole and links with one atom of hydrogen and one of oxygen from the water, with the result that caustic soda is deposited at the metal electrode. This nascent sodium hydrate has a solvent or fibrolytic action on the structures in contact or near the negative pole, and is found useful in many cases of stenosis. The chlorine ions travel towards the positive pole and link with one atom of hydrogen forming hydrochloric acid. This will combine with the metal electrode (if it should be of copper, zinc or some solvent metal) and form the chloride of that metal. If the metallic action is not required at the seat of contact, platinum is used, since this metal is only split up in the presence of strong acids. This method is useful in the treatment of menorrhagia and metrorrhagia using a copper electrode, from the caustic effect of copper chloride on the uterine mucosa. When zinc is used as the electrode the action is milder, and its chloride has antiseptic and astringent properties in many uterine complaints. Dysmenorrhœa, due to stenosis, is treated by inserting into the os a metal sound, insulated everywhere but at the part in contact with the cervix. The metal of which the sound is made is immaterial since it is to be connected to the negative pole by a terminal attached to it, and therefore no metallic ions are detached at that pole. The positive pole is connected to a wet pad on the abdomen. A current of about ten to fifteen mil. amps. is slowly turned on and continued for fifteen minutes, when the sound which was tight before will be found quite loose in the cervix. The froth which is found on the sound when it is withdrawn is due to the hydrogen developed on its surface. This treatment is commenced

soon after a period is over, so as to get at least three applications before the next is due; as there is generally some reaction for a day or two, the applications should be made at intervals of five to seven days, to allow this to subside. There is not much difference in the symptoms of the six cases of dysmenorrhœa I have treated except in the degree of pain and reflex disturbances set up. All the patients were free from pain for some months after treatment—except one who refused to have more than two applications. Two patients have had no pain for two years.

Menorrhagia and metrorrhagia are treated by using an insulated copper sound. This is inserted into the uterus and connected to the positive pole. The abdominal pad is connected with the negative pole. A current of from fifteen to twenty mil. amps. is slowly turned on and continued for about ten or fifteen minutes. The nascent chlorine which develops at the surface of the sound acts on the mucous membrane and causes a local inflammation and at the same time some copper ions are carried into the uterus for a short distance accentuating this inflammation and causing an obliterative arteritis in the vessels of the mucous membrane. There is a good deal of reaction after the treatment and a dirty brown vaginal discharge. Pain does not follow the treatment, or at most is only a slight backache. As a rule a further application can be given in a week. After the treatment has been given the sound is found tightly fixed in the uterus and cannot be removed till the current has been slowly switched off and then reversed for about five minutes or more. This is due to the caustic action of the hydrochloric acid on the tissues. On no account must the sound be removed until it is quite loose, or a piece of the mucous membrane will be torn off and be found adhering to the metal. With cases that have a reasonably open cervix I wrap some absorbent wool tightly round the bare part of the sound and wet it before insertion with a 1 per cent. copper sulphate solution, then there is no adhesion at the end of the treatment.

CASE 8.

Case of menorrhagia. Miss A. (Mr. C. Martin). Menorrhagia fourteen days with leucorrhœal discharge after, for some years. She was curetted once with no improvement. Very anæmic, as she had an interval of only a week or less between periods. Nine applications resulted in a cure. She has had no return of the hæmorrhage or leucorrhœa since the treatment nine months ago.

CASE 9.

Case of menorrhagia. Miss B. Menorrhagia since puberty. Loss for three weeks and then a serous discharge till the next

period. Curetted once with no benefit. Eight applications stopped the loss of blood and most of the discharge. She kept well for three years, but had a return of the flooding which necessitated hysterectomy. It was found that she had old tuberculosis of the Fallopian tubes.

CASE 10.

Case of menorrhagia. Miss C. (Mr. Jordan). Menorrhagia three years. Loss lasts fourteen days with clots. Curetted three times with no benefit. Uterus big and flabby, os patent. This patient had thirteen applications. The copper sound was wrapped round with cotton wool and wet with solution of copper sulphate, so as to reach a larger surface of mucous membrane than the bare sound would have done. There was but little improvement in this case.

CASE 11.

Case of menorrhagia. Miss D. (Mr. C. Martin). Menorrhagia for years. Curetted twice but still continued to lose. No salpingitis or displacement. She had four applications and was much improved. The bare copper sound was used. This patient could not continue the treatment as she lived at a distance, but she is still keeping fairly well.

CASE 12.

Miss E. (Mr. Hewetson). Chronic metritis. Menorrhagia and leucorrhœa. Redness and burning down the legs. Vulvitis. Curetted once. This case was treated with the bare copper sound first for six applications to improve the uterine condition and afterwards with the glass tube and solution of copper sulphate. When the discharge and vulvitis had cleared up she had several applications of high frequency with the glass vacuum vaginal electrode for the irritation. Altogether she had seventeen treatments and keeps well.

Whilst not suggesting that the treatment by ionization of the various conditions enumerated should supersede surgical methods, I nevertheless feel sure that there are many cases in practice in which this method might be given a trial before deciding on operation. Further, we have an additional method of treatment to fall back upon if operation has failed to cure.