

## GYNECOLOGICAL ELECTRO-THERAPY.

By GEORGE ADAM, M. D.,

SAN FRANCISCO, CAL.

I think it advisable in presenting this paper to treat in a general way a few of the numerous conditions where indications exist for the employment of electricity in diseases of women, in preference to directing attention to one particular case, and more minutely describing its details.

I am quite aware I am treading on delicate ground, and that for various reasons this useful and powerful agent has not, and will not for some time, become as universal a favorite in gynecology as it deserves.

Stated broadly, the claims of electricity to a place in gynecological therapeutics are as follows: It regulates the circulation of the whole pelvic cavity, corrects nutritional faults, stimulates functional activity, stops hemorrhage, relieves pain, destroys microbes, causes retrogression of benign tumors, and in its action always tends toward the normal, thus restoring general and local health. Electricity, when scientifically applied, is absolutely without danger or risk of either mutilation or more unfortunate results. In addition its general sedative action in allaying the accompanying nervous irritability deserves consideration.

### FIBROID TUMORS.

Apostoli's successful treatment of fibroid tumors by scientifically-applied currents did more to attract the attention of the specialist in gynecology than any other event in the history

of electro-therapeutics. This was largely owing to his persistent advocacy of his discovery, but no doubt the physical dimensions of the results obtained were a factor of importance. Apostoli's discovery attracted the attention of the most eminent surgeons—notably Dr. Thos. Keith of London, who was the first to successfully remove large numbers of fibroids with the knife, and who afterwards announced in his work that he had given up all other treatment and adopted that of Apostoli.

The mode of action of electricity on fibroid tumors is greatly misunderstood, the large majority of physicians believe that there takes place a physical and chemical decomposition of the tumor, brought about by the electrolytic action of the galvanic current. This is indeed possible by using very large amperage, but at the risk of causing a mass of dead tissue around the electrodes, which even if not dangerous would not be desirable. What is desirable, and what happens from the use of currents of medium volume and duration, is the setting up of a retrograde metamorphosis, stimulating tissue waste, and quickening lymphatic action so as to produce absorption and elimination of the products, thus causing a shrinkage of the whole tumor-mass. This process continues long after the application has been made. As a result, the abnormal cell-proliferation throughout the tumor is diminished, and the growth and resistance of the cells of the normal surrounding tissues are promoted. Electricity stimulates the natural forces which by their comparative latent condition allowed the unnatural excess of cellular growth to take place.

The part of the body between the electrodes, that is the interpolar space or electrolyte, is brought under the influence of the current, and what takes place at the poles or electrodes, will, in some degree, take place at the polar ends of each muscular fiber, and each individual cell within the electrolyte. In fact every cell, every fiber, blood-vessel, lymphatic and nerve-filament constitute distinct electrolytes, with consequent

electrolytic results, only the current being more diffused when passing through the body, the results within are not so pronounced as those that take place without, or in immediate proximity to the electrodes.

All fibroid tumors in the early stages are suitable for electrical treatment, but there may exist some contraindications within the pelvis, such as a collection of pus, in which case the aggravation of the symptoms will positively announce that electricity is forbidden. Those tumors that have become very large and are abdominal rather than pelvic in situation, require care in selection, and of these the intramural variety are most amenable to treatment. However, there are certain round fibromas of very firm texture of the intramural or interstitial class that yield to treatment slowly. These are generally found to be mono-centric, and the cavity of the uterus is found stretched on one side of the tumor. On the other hand when the cavity is more central, and the tumor is of a multi-nuclear character, we may safely prognosticate considerable reduction in its size and symptomatic cure.

The submucous variety are also favorable cases, the stimulation of the muscular fibers of the uterus produces a denutritive effect on the tumor by cutting off the blood supply, thus aiding the direct electrical action: besides the tumor becomes more pedunculated and its situation brought more clearly within the uterine cavity.

The subperitoneal variety of fibroid tumors especially when pedunculated, and when they have become abdominal in situation are not easily reached by electrical applications, although success has been obtained by abdominal puncture. When located in Douglas' pouch, vaginal puncture through the posterior median line may be used, or the electrode may be placed in the vagina pressing against the tumor. The latter method I have found sufficient in one case.

The intrauterine and puncture methods of applying electricity are contraindicated when the tumor is a fibrocyst or an unusually soft myoma, and this is also true of all fibroids when accompanied by acute or purulent pelvic lesions. When there exists a non-purulent inflammation, these vigorous methods should not be used until by vaginal applications the inflammatory condition subsides.

With regard to the methods of application there are two points of importance that ought to be kept constantly in view: First—That success depends on the direct action of the agent on the cells of the tumor, and, second, on the inhibition of its blood supply by the general action of the current on the blood vessels in the interpolar space, but particularly by its stimulation of the uterine muscular fibers surrounding the pedicle, thus ligating the arteries at the main source of supply. It will thus be seen that the intrauterine method is the one most generally indicated.

Vaginal and abdominal puncture and more particularly the last should not be undertaken without special study in this direction, and perhaps should be left to the electro-gynecological specialist.

The following cases will sufficiently illustrate intrauterine applications:

Mrs. E. L., age 45 years, came to my office August 24, 1897. She was suffering from headaches, particularly referred to the back of the eyes, backache in the lumbar region, nausea, pains over lower abdomen, and had considerable abdominal distension. There was a stubborn constipation, having no movement without cathartics. The menses were regular and of normal amount. On making a vaginal examination I found a tumor extending upward in the median line to within one and one-half inches of the umbilicus, and with lateral branches in the broad ligament. The sound showed the uterine cavity five inches in length. I made the diagnosis of a multi-nuclear



interstitial fibroid, and explained to the patient the nature of the growth. I told her there was one of two things to do; either to use the knife or apply electricity. She afterwards consulted two physicians at the polyclinic, and with me saw Dr. W. H. Mays. They all confirmed the diagnosis, but were agreed that removal of the uterus was necessary. It was a month later when I saw her again. She had made up her mind to have the electrical treatment. This was commenced by the use of mild galvanic and high tension faradic currents in order to overcome the painful condition of the parts, the positive pole being placed in the vagina and the negative on the abdomen. After two weeks the intrauterine electrode was employed once a week, commencing with a current of 30 milliamperes and gradually raising it, until the fourth week of the treatment she received 240 milliamperes, which I found to be the highest point of tolerance. The length of *seances* was about ten minutes, during seven of which the current was at the maximum. After two of these applications she was confined to the bed for one day. In the interval between the others she came to the office and received treatment by the faradic current. For the next three months she received a bi-monthly galvanic intrauterine application of 100 to 120 milliamperes. In the intervening time, on an average of three times a week, the high tension faradic current by the bipolar method was employed. She was under observation for about six months more, during which time, twice a month, the constant current in moderate doses of 40 to 60 milliamperes was applied, generally followed by faradization. The highest point of the tumor had now retreated to three and one-half inches from the navel, and the uterine cavity was less than three and one-half inches in length. She had no backache, headache, nor other symptoms, and was able to do her work, which was hard. In fact, she was symptomatically cured, and would not have known that any part of the tumor remained if not told

that such was the case. It is now two years since treatment was stopped, there has been no return of the symptoms, and she is now, and has been, working to support herself and sick daughter.

The next case will illustrate what can be done by merely vaginal treatment. Mrs. E. J. S., age 34 years, a widow with one child, was seen by me in September, 1898. She complained of abdominal soreness, and cramps with constipation, painful urination, headaches—frontal and on top. She menstruated every two weeks; and sometimes almost continuously, and had been partly confined to the bed for two months. Her legs were edematous, and there was some distension of the abdomen, and anemia existed from loss of blood. Vaginal examination revealed a large tumor behind the uterus, completely filling Douglas' cul-de-sac, but entirely contained within the pelvis. The uterus was pushed forward against the bladder. The diagnosis was a fibroid. She afterwards consulted Dr. Winslow Anderson, who confirmed this diagnosis.

The treatment consisted of tri-weekly vaginal applications of the galvanic current, the active pole, which was the positive, being placed behind the uterus and pressed firmly against the tumor, the indifferent pole being placed over the abdomen. The current was increased from 30 milliamperes to 100, which was the maximum strength at any sitting. When she complained of soreness from the effects of treatment by galvanization, faradization was resorted to. The treatment was continued for three months when she felt perfectly well, all the symptoms having disappeared. She had returned to work after the first month. From the third to the sixth month, the treatment was of an irregular character, the patient coming to the office when convenient. She has been under observation since that time, and there has been no return of the symptoms. The tumor is still in evidence, although much reduced in size, allowing the uterus to approach its natural position, thus relieving

meet the requirements for the successful treatment of the pathologic conditions, and, following the removal of the causes, the correction of the displacement, either by the same treatment alone or assisted by other means, will, in a majority of cases, be accomplished.

It is essential for the success of the treatment that at its commencement particular attention should be given to the hyperplasia, or to its causes, which may be an endometritis or other co-existing inflammation. The distress and the painful symptoms, which the patient complains of, will thus be relieved, at the same time a concurrent treatment may be instituted to strengthen the muscular supports. A moment's reflection will at once convince any one that merely replacing the uterus by means of a pessary will tend to add to the insufficiency of the muscular structures by relieving them of all duty, whereas the reverse is the case by employing electrical gymnastic treatment. The one tends to bring about a physiological state, the other by causing atrophy of the muscular layer of the vagina and round ligaments, hastens fatty degeneration and renders the primary lesions permanently incurable.

The successful use of electricity in displacements rests on its power of sedation to painful and inflammatory conditions, on its stimulating action on muscular tissue, and on its influence in liquefying and absorbing exudations. By its electrolytic, cataphoretic and electrotonic properties these results are accomplished.

Scientifically-applied currents must, of necessity, vary as to the method, according to the symptoms presented, and to obtain the desired degree of success requires a special knowledge of gynecological pathology added to a special knowledge of electro-therapy.

Painful and inflammatory conditions approaching acuteness need to be subdued by vaginal applications, using the positive pole of the galvanic current, or the high tension faradic



current, and preferably the bipolar method. If the uterus is fixed in its abnormal position, vaginal galvanic and faradic applications should be made until a certain degree of mobility is obtained, and here the negative pole for its power of softening exudations and promoting absorption is indicated. After there is a certain degree of mobility the intrauterine method may be employed, but this will vary, as to pole, dosage and length of *seance*, according to the sensitiveness of the endometrium, and according to the existence or non-existence of an endometritis. Carefully applied positive galvanic currents of small amperage will soon overcome the sensitiveness of the membrane, and then the negative pole can be used. Vaginal treatments can be interspersed, if necessary, with intrauterine applications, thus correcting any unpleasant symptoms set up.

When there are no acute symptoms, or when those present are subdued, negative electrolysis assisted by the slow interrupted primary faradic current should be resorted to. Contractions and relaxations, say sixty times a minute, produced by the faradic interrupted current of quantity on the pelvic muscular tissue, have a powerful influence in breaking up adhesions, the whole pelvis is seen to vibrate under current influence, but caution must be had in using this method, for if there exist any pelvic acute inflammatory action, harm may result.

A thick, tenacious uterine secretion calls for the liquefying action of negative galvanization, even if positive polar sedation were otherwise indicated. The catarrhal secretion being thinned, the endometrium cleansed, and the canal rendered patulous for drainage by cathodal applications, the anode will be more effectively applied. In using the anode in the cavity of the uterus, especially with large currents, there will be considerable adhesion of the instrument to the endometrium, and care ought to be exercised in with-drawing, by cautiously rotating the electrode; otherwise injury to the membrane may result.



In using currents in pelvic disease, as elsewhere, dosage is important. In general, it may be said that acute or painful conditions require carefully applied currents of small amperage; while chronic troubles, and especially if electrolytic action is indicated, require larger force. Pain at the internal electrode is a signal for caution, but if at the indifferent pole it is a notice for a larger electrode, and a better conducting surface. Consciousness of the current at the internal electrode shows the approaching limit of tolerance. The faradic current is best measured by the sensations of the patient; it should never be applied to the extent of causing pain. When stimulating currents are used it is better to stop abruptly; when the current is sedative, gradually reduce it to zero.

The following case will in part exemplify the method:

Miss B., age 24 years, a bookkeeper, consulted me about four years ago. She had a retroflexion and had previously been treated by a number of physicians, with pessaries, tampons, etc., but with no permanent improvement. They had proposed a surgical operation, but this was not consented to.

For the next two years the treatment was about as follows: I would insert a pessary, which would make her comfortable for about a month; as she had to stand a great deal, she would then feel uncomfortable, and tampons would be employed for a week or two and the pessary re-inserted. At the end of two years, nothing had been gained, but of a temporary nature, for as soon as the artificial supports were removed, the uterus would resume its retroflexed position. With the displacement, there co-existed a thick leucorrhœal discharge, an endometritis, and dysmenorrhœa. These were only partially and temporarily relieved by the treatment. No doubt, the character of the patient's employment was an important factor in the causality of these relapses.

At this time I resolved to try electrical treatment. In such a chronic case with muscular atrophy or degeneration, it

would be needless to expect immediate results. For the temporary support of the uterus, therefore, I determined on the retention of the pessary. The office visits were irregularly made, as the patient's employment interfered. However, from once to four times a week the high-tension induced current was applied, with considerable gain in the comfort of the patient and a modification of the symptoms at the end of the first month. For the relief of the tenacious discharge and endometritis two applications of intrauterine negative galvanization were made, followed by six applications of the positive pole. These were made about once a week, together with concurrent faradic treatment, as before mentioned. This brought us to the end of the third month of the treatment, with an all-around improvement.

I then changed the character of the electrical treatment to a more stimulating one and the slowly-interrupted, induced current of quantity was selected. This treatment was kept up for nine months, making in all one year of electrical treatment. During this time the pessary had never been removed, except for the purpose of applying the current, when it was immediately replaced. It was now removed and the treatment by the current alone continued for three months more. At the end of fifteen months of treatment it was found that the uterus maintained its position, being slightly inclined backward, and the symptoms had permanently disappeared.

#### DYSMENORRHEA.

In a large majority of these cases there exists a hyperesthesia of the endometrium, especially at the os internum, and this is often combined with stenosis and flexion; not uncommonly there exists imperfect development with induration or degeneration. Painful menstruation may be due to endometritis and this may or may not take on the form of the

membranous variety. Disease external to the uterus may co-exist or be the cause. The pain may be accompanied by profuse or scanty menstruation.

In the electric current will be found an effective means of combating the evils. Positive or negative galvanization, or the faradic current of high tension, or the faradic current of quantity being indicated according to the symptoms and their causes, although some of the cases are relieved by external or vaginal applications, yet the intrauterine method will generally be required.

The following case will illustrate the procedure :

Miss B., age 18 years, had been menstruating for six years, during three of which she had suffered great pain, being confined to the house, and even to the bed for two or three days every period. When she came to the office she said she wanted electrical treatment for the pains, but refused to be examined. The high-tension faradic current was applied externally three times a week. On next menstruation there was no apparent improvement. When she returned she was willing to submit to any treatment in order to get rid of the pain. This was commenced by vaginal dilatation by means of a small speculum, which was sufficiently accomplished in one week. As the menses were scanty the method of electrical treatment selected was intrauterine negative galvanization. Placing the positive electrode over the abdomen, and introducing the vaginal speculum, the intrauterine electrode was gently pressed against the os, which it barely entered, then carefully turning on the current it was gradually raised until marking 10 milliamperes; continuing the pressure the electrode slowly passed to the internal os, as at this point the patient complained of pain I carefully reversed the controller to zero, withdrew the instruments, and inserted a tampon of boro-glycerin. Two days afterwards, at the next sitting, the electrode entered freely to the internal os, and the current



Mrs. R—, age 28 years; had four children. After last confinement had felt miserable, with pain and weakness in back, pain over bladder and ovaries, and headache. One year and a half subsequent to this confinement she had a miscarriage induced by her condition. When the menses next appeared she flowed for two weeks, and for this she consulted me at my office. Examination showed a unilateral laceration of the cervix involving the whole of the intravaginal portion. The ovaries and tubes were tender and congested, the uterus enlarged and giving exit to a bloody discharge. I gave her a positive intrauterine galvanic application of 30 milliamperes for ten minutes. Next day I repeated the application, increased to 75 milliamperes, which stopped the blood entirely, and there was marked improvement in the general condition. The applications were then repeated every second day for the next week, and then twice a week until the next menstruation, which was rather profuse and lasted eight days. During the next month she received six galvanic intrauterine applications, alternating with slowly interrupted induced current of quantity, when the menstrual flow became normal, the tenderness of the ovaries and tubes had disappeared, the uterus was of normal size, and the patient felt better than she had for two years. She is at this time seven months' pregnant, and feels comfortable and well.

In comparing these two cases it is found that both had laceration of the cervix. No. 1 was operated upon, No. 2 was not; both continued to suffer. No. 1 was partly relieved by a subsequent pregnancy, but afterwards miscarried, and was entirely relieved by electrical treatment. No. 2 miscarried and was relieved by the same applications, and is now well advanced in pregnancy. I am not to be understood as advocating surgical non-interference in such cases, but I say this: that surgeons who operate for the purpose of relieving certain symptoms, and fail, should understand that there is an infallible agent in electricity for accomplishing symptomatic cures.