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ORIGINAL ARTICLES.

THE TREATMENT OF FIBROID TUMORS OF THE UTERUS BY GALVANISM: WITH CASES.

Read in the Section on Obstetrics and Diseases of Women, at the Thirty-ninth Annual Meeting of the American Medical Association, Cincinnati, Ohio, May, 1888.

BY FRANKLIN H. MARTIN, M.D.,

PROFESSOR OF GYNECOLOGY IN THE POST-GRADUATE MEDICAL
SCHOOL; FELLOW OF THE CHICAGO GYNÆCOLOGICAL
SOCIETY, ETC.

Before this Section at the St. Louis meeting two years ago, I read a paper on the value of galvanism in gynecology, and among other cases reported three of fibroid tumor of the uterus treated by the method. In December of the same year, 1886, I read a paper before the Chicago Medical Society, describing Dr. Apostoli's method of treating these difficulties; and before the Section of Gynecology at the Ninth International Medical Congress, I read a paper on "A Method of Treatment of Fibroid Tumors of the Uterus by Apostoli's Method, based upon Exact Dosage;" and I now ask you to bear with me while I report a few cases of the many of fibroid tumors of the uterus treated by the latter method, which have come under my observation, and give you the benefit of conclusions arrived at as the result of this experience.

In the treatment of fibroid tumors of the uterus by Apostoli's method, I have made some changes in the way of electrodes and other apparatus. Instead of the inconvenient biscuit of clay used by Dr. Apostoli for the external electrode I employed the animal membrane abdominal electrode.¹ By the adoption of flexible intra-uterine electrodes I am able to do away almost entirely with the vaginal galvano-puncture of Apostoli's, and by a system of internal concentration a more exact system of dosage has been made possible. Of these internal flexible concentration electrodes I have confined myself so far to two sizes—one of an active surface of 2 sq. cm., the other of 4 sq. cm. The first of these, (the 2 sq. cm.), I have determined by experiment, requires a 50 milli-

ampère current; the second, (the 4 sq. cm.), requires a 100 ma. current, in order to get the characteristic effect over that extent of surface sufficient to check hæmorrhage. It can readily be understood how, with accurate adjustment of the electrodes a given effect can always be obtained with a given current, and by attacking different portions of the mucous membrane at different sittings, the characteristic effect of the current can be accomplished with greater certainty over all the surface, and with less discomfort to the patient, than when an electrode filling the entire canal is employed, the extent of surface disregarded, and the current simply regulated by the sensations of the patient. Then, too, these internal electrodes being constructed with a special idea of flexibility, renders it possible to reach the entire inner surface of any uterine canal, no matter how tortuous it may be, rendering it unnecessary in a greater number of cases to employ the more or less dangerous puncture. From Jan. 1, 1887 to Jan. 1, 1888, I applied galvanism in strong, accurately measured and definitely concentrated doses, in gynecological cases over 1,400 times. I employed it during this time to fibroids of the uterus 623 times in fifteen cases. The result was as follows:

Found not suitable for treatment and recommended for operation, 1; Benefited and still under treatment, 4; Absolutely cured, 5; Symptomatically cured, 5.

Case 1.—Diagnosis: large, painful, hæmorrhagic, interstitial and subperitoneal fibroid tumor, filling the pelvis and extending nearly to umbilicus. Treatment: A large number of applications of galvanism, given by three different methods of procedure, extending over a period of over two years. Result: Benefited.

The first case I have to report is a continuation of the history, cited as *Case 10*, in an article read by me before the Section of Obstetrics and Diseases of Women, at the thirty-seventh annual meeting of the American Medical Association, at St. Louis, May 5, 1886.

Miss C., unmarried, æt. 26, consulted me on account of abdominal tumor. She had previously obtained the advice of a homœopathic physician, who had Dr. Ludlam, of Chicago, see her, in consultation, and was pronounced by them in-

¹ These electrodes are illustrated and described in the Transactions of the Ninth International Medical Congress, and in the N. Y. Medical Record, Dec. 17, 1887.

curable. Upon examination I found a large abdominal tumor attached, as I then thought to the whole anterior wall of the uterus, crowding that organ away from the bladder. I have since ascertained that the portion previously diagnosed as the uterus is simply the cervix, the uterus being lost in the mass of the tumor, and its canal traversing its entire depth. The tumor was ovoid, smooth, and easily movable under the abdominal walls, about seven inches in its long and six inches in its transverse diameter. It was growing rapidly when she came to me, but an operation for its removal by abdominal section was refused. I therefore, with the idea of preventing further growth, if possible, and of checking the hæmorrhage, gave her iodine and ergotine treatment. After a lull in this treatment and considerable progress in the growth of the tumor, at the patient's request galvanism was commenced.

A uterine bulb electrode was introduced into the cervix, or a vaginal ball electrode was pressed firmly against the tumor where it rested against the anterior wall of the vagina, while a large hand sponge electrode was applied over the tumor on the abdominal wall. From 15 to 20 milliamperes were borne by the patient at each séance, each of from fifteen to twenty minutes in length. The treatment was repeated every second day for about two months, when, not only the progress in its growth was checked, but the tumor was reduced in size. The treatment, for unavoidable reasons was discontinued for a month, when the tumor made rapid progress in growth. The galvanism was again commenced and continued for about two months, with still further diminution in the size of the tumor. At this time the case was reported as already stated. In my report at that time, not being so familiar with Dr. Apostoli's methods as now, I said: "This case would have made much better progress if the treatment had been given every day instead of every second day, or I think galvano-puncture would give better satisfaction."

In September, 1886, the patient being impatient for rapid improvement, I advised and instituted the more radical treatment of abdominal galvano-puncture. With the assistance of Dr. E. L. Hollister, of Chicago, four operations were performed in intervals of ten days. The patient was anesthetized, and a steel needle 4 mm. in diameter with a trocar point, insulated with hard rubber to within 3 cm. of the point, attached to the negative pole of the battery, was thrust through the abdominal wall into the thickest portion of the tumor. A large animal-membrane electrode was placed upon the abdomen in close proximity, and attached to the positive pole of the battery. A current of 200 ma. was turned on and allowed to pass for fifteen minutes. The

effect of these operations was a rapid diminution in the size of the tumor. The patient was then advised to rest and await further developments.

At the end of two months she returned, stating that the growth of the tumor had recommenced, the hæmorrhage being excessive. Dreading the necessary risk attendant upon abdominal puncture, and having at this time successfully treated a number of cases by Dr. Apostoli's method, I determined to adopt that safer, and, in my opinion, much more effective means. Therefore, in January, 1887, regular treatment was begun, consisting of the introduction of a plain Apostoli intra-uterine platinum electrode to the bottom of the uterus, which at this time measured $18\frac{1}{2}$ cm. or seven inches in depth. To this electrode was attached the negative pole of the battery, and the circuit was completed by the use of the animal membrane electrode. Seven treatments were given before the first of February, when menstruation appeared. The first four of these treatments were of the negative intra-uterine, the last three of the positive intra-uterine. The strongest current borne by the patient was 50 ma. The menstruation following was painless, but the hæmorrhage was as excessive as ever. No change in tumor.

In *February* the patient received but four treatments; all negative intra-uterine. No apparent result on tumor or amount of flow, still no pain at menstruation.

March, two treatments only were given, both intra-uterine negative of about 50 ma. strength. The amount of flow this month caused considerable exhaustion, but no pain. No apparent change in tumor.

April, eight positive intra-uterine applications were made, with a view if possible of modifying next flow. The patient was able to tolerate without discomfort a 100 ma. current. Menstruation was not materially modified, notwithstanding the strong current and the positive pole. Tumor, however, shows signs of reduction. Uterus measures 16 cm.

I became convinced at this time that the current borne by the patient was not sufficiently strong to produce the desired coagulating effect upon the whole surface in contact with the long internal platinum electrode. The current, in other words, was not sufficiently concentrated at any one point of the comparatively large surface of the platinum to produce its characteristic coagulating effect necessary to check hæmorrhage. I, therefore, at this point, adopted my concentration electrodes. The one constructed for this case, was 3 mm. in diameter, and had an active surface of 4 sq. cm. The current this surface required was the maximum the patient had been able to tolerate, 100 ma.

May, five positive intra-uterine applications were given with the new electrode. At the first

application the active portion of the electrode, the distal end, was introduced to the bottom of the canal and the necessary current, as indicated by the milliampère metre, was turned on and allowed to act for five minutes. A gauge on the staff of the sound marked the distance to which the instrument entered the womb. At the next treatment this gauge was placed so that the active portion of the electrode would just reach the point acted upon at the previous treatment. This same principle was carried out until every portion of the canal had been treated by the concentrated current. Five treatments were given before menstruation. The effect was marvelous. The flow continued but three days instead of eight, as before, and the amount was barely a show; no pain.

June, four intra-uterine negative treatments early in the month were given with the concentration electrode, when the patient left the city for three weeks.

July, thirteen intra-uterine treatments were given. The first six negative, followed by seven positive. Tumor decreasing in size. Depth of uterus 15 cm. No pain at menstruation and otherwise normal, lasting four days.

August, five treatments, negative.

September, six treatments; two negative, four positive. Measurements of the abdomen were made at this time over the most prominent portion of the tumor; the measurement was $37\frac{1}{2}$ inches.

October, six treatments, all negative intra-uterine. Menstruation still remains scanty. Patient gaining in flesh and improving in general health.

November, nine treatments, three before menstruation and six following, all negative intra-uterine. Patient improving in general health, menstruation more natural, no pain at any time. Old neuralgia entirely disappeared. Patient walks about the city and enjoys perfect health, except some little difficulty in the bladder; desires to urinate frequently.

December, five intra-uterine negative treatments. Although patient has gained in flesh since measurement was made, October 19th, she is two inches smaller, or $35\frac{1}{2}$ inches at the same point. Depth of uterus 14 cm. or $5\frac{1}{2}$ inches.

Thus this patient has in one year gained in flesh, in strength, has normal menstruation instead of menorrhagia, is perfectly free from pain. The uterus has been reduced from 7 to $5\frac{1}{2}$ inches in depth, and the mass of the tumor is reduced fully one-third in size.

January 1, 1888, patient still under treatment.

Case 2.—Diagnosis: Bleeding, painful, myofibroma of the uterus. Treatment: Thirty-two applications of galvanism. Result: Cure.

Mrs. D., æt. 24, married two years, no children, no miscarriages. Puberty at 14. Menstruation irregular and profuse, lasting five or six days. Headaches severely at menstruation and severe

neuralgic pains of the pelvis following. Bowels constipated, hemorrhoids, leucorrhea, frequent and painful urination. Local examination discloses small vagina, large patulous cervix, with uterus large and canal taking the direction parallel with the axis of the body, and measuring 11 cm., or a trifle more than 4 inches in depth. With sound in uterus and by bimanual manipulation there could be distinguished a thickening of the anterior wall of the fundus. The uterus in the rectal-abdominal examination appeared at least double its natural size, smooth and regular in contour, with a disproportionately enlarged fundus. Dr. Arvid H. Wimemark assisted me in a few of the treatments given this case.

The first twelve treatments received by this patient were after the unmodified Apostoli method, without any attempt at accurate concentration, and a current varying from 100 to 200 ma. in strength. Six intra-uterine galvano-negative treatments were given in the first fourteen days, followed by four galvano-positive treatments, one for every second day, in order to modify the amount of the approaching menstruation. Following the first menstruation two more of these applications were made, when I adopted the method of internal concentration before referred to, using the 4 sq. cm. surface with a 100 ma. current. Thirty of these treatments were afterwards employed; twenty-two of the galvano-negative and eight of the galvano-positive. The whole time of treatment extends over three months, including three menstrual periods.

The effect of the treatment was markedly noticed in the behavior of the first menstruation, the flow having been modified in quantity, and without the slightest pain. The second menstruation lasted but two days, was very scanty and entirely free from pain. The third menstruation lasted three days, was free from any annoyance, and the flow small in quantity, with no pain. The depth of the uterus had not markedly decreased, but was smaller in contour at the first menstruation. Before the next menstrual period the uterus measured 9 cm. and a marked decrease in the general size of the uterus was evident both to the touch and sight, viewed through a speculum. The third menstruation left the uterus 7 cm. in depth, normal in contour, with no evidence of a thickened fundus, no leucorrhœa. Dysuria and constipation had both disappeared.

The patient, who had previously been anæmic in appearance, is now quite full blooded and in the best of health. The weight had not been noted at the beginning of the treatment, so the exact gain could not be determined, it was estimated, however, at about fifteen pounds.

This is one of the few actual cures reported by this method of treatment, and I have no doubt that it will remain permanent.

The patient was one who never complained of

the strength of the current and never expressed any discomfort from its use. It acted as a tonic always, and she was capable of greater exertion and more work on the days of the treatment than on off days.

Case 3.—Fibromyoma in anterior wall of uterus. Treatment, galvanism. Result, improvement in general health and slight reduction of the growth.

Miss E., unmarried, 25 years of age, referred by Dr. Wm. Bell, of Benton Harbor, Mich. Menstruation commenced at the age of 13. The flow has never been scanty, at the same time not profuse, and rather irregular. Patient is not able to get about much at the menstrual period because of neuralgic pain and excessive nervousness.

Physical examination. Uterine axis lying in the direction of the axis of the body, with a depth of $7\frac{1}{2}$ cm., or 3 inches. Upon the anterior wall, appearing to be attached to the uterus about its centre, is a well-defined growth of a hard, unyielding nature, approximating the following diameters: Anterior posterior diameter to uterine canal 8 cm., or $3\frac{1}{4}$ inches; transverse diameter $7\frac{1}{2}$ cm., or 3 inches. The growth is smooth, and the attachment, while broad, is somewhat pedicular.

This patient was sent to me, and treatment was commenced October 13, 1887. The treatment adopted at the beginning was very simple and did not prove very effective. A vaginal electrode, attached to the negative pole of the battery, was passed well up against the tumor as it rested on the anterior vaginal wall, and a large flat sponge electrode was applied over the growth upon the abdomen. A current of 20 to 30 milliampères was used according to the toleration of the patient with that variety of surface electrode. The patient received thirty-nine of these treatments in about forty-five days.

The menstruation was attended with much less pain and nervousness and lasted about four days. The interval between the beginning of the two menstrual periods was twenty-eight days. The growth had apparently reduced about one-fourth in size. The depth of the uterus remained the same as at the beginning of the treatment.

Case 4.—Large, painful, interstitial, bleeding myofibroma of the uterus. Treatment, fourteen applications of galvanism. Result, relief of pain and menorrhagia, diminution in size of tumor, restoration to health.

Miss L., æt. 39, unmarried, consulted me in November, 1886. *Subjective symptoms:* Excessive weakness, inability to walk without great fatigue, excessive and exhausting menstruation, lasting from ten to twelve days, sudden attacks of excruciating neuralgic pain in the tumor.

Objective symptoms: A large growth, extending from the umbilicus above and filling the pelvis, occupied the abdominal cavity. The mass was smooth and regular, with the exception of a lobe $2\frac{1}{2}$ inches in diameter, which appeared to be at-

tached to the left side of the main growth. Measurements of abdomen, at umbilicus $30\frac{1}{2}$ inches; midway between umbilicus and pubes, 35 inches. Cervix large and patulous, canal small and tortuous—the flexible probe, upon withdrawal, presenting the appearance of a right-handed corkscrew. Depth of uterus 21 cm., or about $8\frac{1}{2}$ inches.

The treatment advised and adopted was a strong current of galvanism applied by Apostoli's method. A probe of pure platinum was constructed which would easily conform to the shape of the canal. I found great difficulty, however, in inserting this electrode, because of the peculiar contortions of the canal. Perseverance and care, however, overcame all obstacles, and after a few treatments there was no further trouble. After the internal electrode was in position it was attached to the positive pole, the large abdominal animal membrane electrode was applied externally and attached to the negative pole. A current was gradually turned on until, at the first treatment, 100 ma. was attained. The treatment carried on in this way never produced any discomfort further than a slight burning sensation of the skin beneath the external electrode, although currents of 500 ma. were sometimes employed.

November, 1886. Patient received nineteen intra-uterine galvano-positive treatments. Has had no attack of neuralgia since commencement of the treatment. Menstruation lasted six days.

December, 1886. Thirteen galvano-positive treatments had been given when menstruation appeared, one week earlier than usual, and lasted eight days; flow profuse, no pain.

January, 1887. Sixteen intra-uterine treatments—eight galvano-negative and eight galvano-positive. Menstruation again appeared after the regular interval, and lasted but two days. This was followed in January by eight galvano-negative treatments. Patient is at this time much improved in general health and is in the best of spirits. Since coming to Chicago she has not had a single return of the paroxysms of pain formerly so much dreaded.

February, 1887. Seventeen treatments; ten galvano-negative, seven galvano-positive. Depth of uterus 19 cm.; tumor visibly reduced. Menstruation lasts five days and is normal—no pain. Patient greatly improved in general health.

March, 1887. Nine treatments, all galvano-negative. Patient returned to her home March 11.

Condition at this time: Depth of uterus, 18 cm. Measurement of abdomen at umbilicus, 29 inches; midway between umbilicus and pubes, 33 inches. While there is this decrease in the abdominal measurements, the patient has gained considerably in flesh otherwise. Patient expresses herself pleased with results of treatment, and leaves with intention of returning upon the reappearance of any of the old symptoms.

During the spring and summer the health of the patient continued to be good but, fearing the tumor was again increasing in size, she returned in October to continue treatment.

Examination October 10: Depth of uterus the same as when patient left, 18 cm.; abdominal measurements, umbilicus 32, and midway between umbilicus and pubes 34 inches, showing that the tumor is rising in the abdomen. Has had no menorrhagia and no pain since treatment was discontinued.

October, 1887. Patient received fifteen treatments, all intra-uterine galvano-negative. Menstruation appeared after second treatment and was perfectly normal.

November, 1887. Nineteen treatments, all galvano-negative. Menstruation normal.

December, 1887. Eleven treatments of the galvano-negative variety were given. Patient returned home December 17 improved in every way. Depth of uterus 16 cm. Abdominal measurements, at umbilicus 30 inches; midway between umbilicus and pubes, 33 inches.

Patient writes January 30, 1888, as follows: "I believe if it had been possible for me to continue with you from the time of the first treatment to the present time, I would have been entirely relieved of this tumor. If it becomes necessary for me to come to you again I shall try to arrange so that I can remain until there is no longer any need for treatment. I feel that I would like any one suffering with a similar trouble to know how much relief I have obtained."

Case 5. Large, painful, hæmorrhagic, interstitial and subperitoneal fibroid growth filling the pelvis. Treatment, thirty-eight negative intra-uterine galvanic applications and eleven positive applications. Result, tumor reduced one-third, hæmorrhage modified, pain relieved.

Mrs. W., colored, married, unipara, æt. 30, and referred by Dr. D. H. Williams, of Chicago, consulted me early in 1887.

Subjective symptoms: Excessive and painful menstruation which lasted ten days, difficult and frequent urination, bowels extremely constipated, sensation of severe pressure upon perineum and rectum, great difficulty in walking, being obliged to remain almost constantly upon the bed. Complaints of "distressing weakness," poor appetite and digestion. These symptoms have developed and been increasing for the past three years.

Objective symptoms: By digital examination, the vagina was found large and shallow, with an irregular mass protruding into its posterior portion and depending from the cervix, which was entirely obliterated in the mass of the tumor. By bimanual manipulation the growth was found to extend to within 2 inches of the umbilicus, presenting a smooth and regular outline anteriorly, and more or less nodular appearance on the margins and posteriorly as far as could be reached

by rectal examination. Depth of uterine canal as ascertained at sixth examination, 16 cm., or 6½ inches. The course, while somewhat tortuous, took an anterior direction. While the growth was interstitial, it was distributed in such a manner as to enlarge the uterus to three or four times its normal size, with its greatest mass situated in the posterior walls.

October, 1886. On account of the tortuosity of the cervical canal I was unable to insinuate even the most flexible intra-uterine probe until after repeated attempts. Having once located the canal, however, it became an easy matter to apply an ordinary intra-uterine electrode. For the first treatments, therefore, I was unable to give more than a vaginal application. The sixth treatment was the first regular intra-uterine application. I commenced with the negative pole intra-uterine.

November, 1886. Five intra-uterine galvano-negative treatments were given. The patient menstruated twice during this month, the intermenstrual period being shorter than usual. The first, while profuse in quantity of flow as usual, and ten days in duration, was painless. The second was attended with similar symptoms, save that its duration was shortened to five days.

December, 1886. Thirteen galvano-negative intra-uterine treatments were given. Menstruation less profuse, painless and of five days duration. A marked improvement noticeable in the general health, spirits and appearance of the patient. Old neuralgia and pelvic symptoms, including constipation, entirely relieved. Tumor reduced fully one-fourth in size. Depth of uterus reduced from 16 cm. to 14 cm.

January, 1887. Eight treatments; two intra-uterine galvano-negative, six galvano-positive. Menstrual period nearly normal, general improvement still continues; patient able to attend to her work and walk about the streets.

February, 1887. Eight treatments; five galvano-negative, three galvano-positive. Menstruation normal, tumor gradually reducing. During this month the patient had an attack of fever which was ushered in by two or three distinct chills. As this attack was accompanied in the early stages by abdominal pain, it looked somewhat ominous, but proved to be nothing but intestinal irritation which was relieved by appropriate treatment. On account of this illness no treatments were given in March.

April, 1887. Nine intra-uterine galvano-negative treatments. Menstruation normal, tumor reduced to about one-third original size. At this time treatment was discontinued.

Case 6.—Fibro-myoma of posterior wall of fundus. Treatment: 62 applications of galvanism. Result: Growth absorbed, all symptoms relieved—Symptomatic cure.

Miss H., Fulton St., Chicago, unmarried, age 24, menstruated at 17. Dispensary case.

This patient presented herself at Chicago Polyclinic Dispensary, May 17, 1887. Complained of excessive flowing, which exhausted her so as to interfere with her duties as a domestic. Paroxysms of pain occurred frequently without warning through pelvic region, from the bladder to the rectum. These, apparently, bore no relation to menstruation. Patient was anæmic; weight 110 lbs.

Patient complained of difficulty in urination; bowels constipated; symptoms had been increasing in severity for two years; has had no local treatment; has taken some internal medication without result.

Local Examination: Vagina small and sensitive. Cervix-uteri small, and situated well back in the hollow of the sacrum, Uterus by bi-manual manipulation appears about the size of three and one-half months' pregnancy. Impossible to introduce sound at first visit.

At second visit was able to introduce a flexible bougie to the depth of 10 cm., or about 4 inches, the probe took an anterior direction, this was followed by an Apostoli intra-uterine sound of platinum, which was attached to the negative pole of the battery. The abdominal electrode attached to the positive pole was applied, and a current of 300 ma. gradually turned on without the slightest discomfort to the patient. This was followed by five negative intra-uterine treatments, on successive days, and immediately before the next menstruation by four positive intra-uterine applications. During these ten treatments the current reached on two occasions to an approximate strength of 500 ma. The patient at these times experienced, apparently, no great discomfort. I discovered, however, that the effect on the mucous membrane of the uterus was too severe, and the current was never afterward allowed to pass 300 ma.

The menstrual period following was free from pain, and the paroxysms which previously had been so distressing, did not occur again. The flow was more profuse than before.

During the next intra-menstrual period patient received fifteen treatments—ten negative, followed by five positive. The former with Apostoli's probe, with a 300 ma. current, the latter by my concentration electrode, 3 mm. in diameter and 4 sq. cm. surface requiring 100 ma. current.

Second menstrual period passed without pain. The flow lasted three days, and was less in quantity than at any time for the past two years. Uterus measured, August 27th, 8 cm.

During next intra-menstrual period sixteen treatments were given—all negative—with the flexible electrode, requiring 100 ma. current.

Third menstruation free from pain, lasted four days, perfectly normal.

Twelve negative treatments were given during the next month. The following menstruation lasted three days, the flow being very scant.

The uterus at this time measured but 7 cm., and was but little larger than normal. The patient had become strong and hearty, weighed 122 pounds, and declared herself perfectly well. She was with difficulty persuaded to take a few more treatments—ten in all—when she stopped coming of her own accord. When seen in December she was well in every respect.

Case 7.—Large, painful, hæmorrhagic myo-fibroma of the uterus, filling pelvis and lower abdomen. Thirty applications of galvanism. Symptomatic cure.

Miss T., unmarried. Consulted me April 1, 1887. Eight years ago she discovered a tumor for which, in 1881, she consulted Dr. T. Addis Emmett, and remained under his care for several months, the principal treatment being the application of tincture of iodine and glycerine tampons. Since that time she has consulted other physicians, but the symptoms have gradually increased, the principal being difficulty in locomotion, frequent and painful urination, chronic constipation, palpitation of the heart, loss of flesh, general weakness, excessive menstruation, lasting from eight to fourteen days, being very violent the first five days.

Objective Symptoms.—Large tumor, about the size of a four or five months' pregnancy, occupying the pelvis, of interstitial variety, increasing the depth of the uterus to 19 cm., or 7½ inches. Cervix large, patulous, and directed toward the sacrum, and entered with great difficulty with flexible probe. Canal exceedingly tortuous and not easily traversed.

Treatment: April.—Eighteen intra-uterine galvano-positive, and eight intra-uterine galvano-negative.

May.—Five intra-uterine galvano-negative, making in all thirty applications, the current varying from 50 to 250 ma. The galvano-positive treatments were administered first, and until menstruation appeared, which was so modified that it was followed entirely by the galvano-negative treatment. While I advised the patient to remain longer with me it was necessary, for private reasons, for her to return home. During her stay in the city, and when under treatment, her general health and nutrition were much improved.

Results.—May 6th, uterus reduced in depth 3 cm., measuring at present 16 cm. Tumor visibly reduced, locomotion greatly improved, general gain in flesh and strength.

Not having had an opportunity of examining the patient since that day I have no means of judging of her condition except from her own words: "You write, Dr. Martin, to know how I am. I am decidedly better. For some time after my return from Chicago I did not think I could live. In July I had a very sharp attack of peritonitis, but that is all over. I have not been as well in ten years. I am a surprise to my friends and to myself, too. Do you think it possible that three

months after treatment the electricity could be having its effect? I am like the man in the Bible, I only know I am healed."

The reply I make to the above question is as follows: The patient has received no other treatment. It is no uncommon occurrence in the treatment of tumors by electrolysis for the growths to gradually reduce in size and symptoms disappear months after the treatments have been discontinued. Verified cases substantiating this fact have been reported by Dr. J. N. Freeman, of New York, by Dr. Apostoli himself, and by Dr. Thomas Keith, also. The fact of this patient receiving thirty very strong applications of galvanism in a little over a month, receiving marked benefit while under treatment, and knowing the history of the case in all its details as I do, leads me to state unhesitatingly that it can be ranked under the same head as those reported by the above operators.

Case 8.—Myo-fibroma of the right horn of the uterus. Excessive hæmorrhage, accompanied and followed by excruciating pain. Sixty-two applications of galvanism. Cure.

Mrs. M., æt. 29, married two and a half years, no children; residence Hyde Park, Ill. Consulted me March 31, 1887. Menstruation preceded, and until thoroughly established, accompanied by pain. Excessive, but not exhaustive flowing has been the rule, lasting on an average seven days. The disappearance of menstruation is followed the succeeding day by the most excruciating pelvic neuralgia that it has been my lot to witness, which lasts about two weeks, and while continuous has periods of greater and lesser degrees of violence.

Local examination revealed the cervix uteri normal and in proper location. A flexible probe entering uterus passes to the depth of 8 cm., or a trifle over three inches, and is posteriorly deflected striking a very tender point at its distal extremity, which causes pain similar to that experienced after menstruation. Bimanual manipulation reveals enlargement of the right horn of the uterus, with a solid growth the size of a goose egg protruding from its surface in the direction of the right ovary. By rectal abdominal examination this proves to be growing from the fundus of the uterus. The whole gives the impression of a right lateral retroversion of a uterus fully four inches in length.

This patient had received treatment and advice from some of the best physicians of the country, including one of the leading gynecologists of Chicago, but had never found the slightest relief. It was with the idea of receiving the galvanic treatment that she was sent to me.

Considering the case suitable for the Apostoli treatment, I commenced it in April. I introduced an intra-uterine flexible electrode 3 mm. in diameter, with an active surface of 2 sq. cm.

in such a manner as to bring the active portion of the electrode in accurate contact with the sensitive portion of the uterus, which had been discovered in probing. It was then attached to the negative pole of the battery, the circuit completed by the abdominal electrode, and a current of 50 ma. carefully turned on. At the end of about three minutes the patient complained of the "old pain." The current was immediately reduced and the treatment ended. She was given stimulants and directed to remain quiet. The pain gradually subsided, and at the end of an hour she was able to return home.

The next treatment, April 4, was similar to the first, save that a much weaker current was used in order to avoid the previous unpleasant effects, and to regain the confidence of the patient. In April, twelve treatments were administered, the strength of the current being gradually increased, until the 50 ma. required were easily tolerated. The first menstruation appeared in the last week of the month and lasted five days. It was followed by the customary pain which, however, was reduced in duration from two weeks to two days.

In May, eight treatments were given; four galvano-negative and four galvano-positive. This month the menstruation lasted but four days, and was succeeded by one day of pain, which was less severe than formerly.

In June, twenty-four treatments were given, all galvano-negative. Menstruation this month lasted four days, the flow very greatly reduced, and to the delight of the patient, the old pain failed to reappear at all.

In July, nine treatments were given, all galvano-negative. Menstruation was perfectly normal. The depth of the uterus reduced to 6 cm. and the foreign growth had almost disappeared.

In August, eleven treatments, all galvano-negative, were given. Menstruation normal and patient's general health excellent.

In September, seven galvano-negative treatments. Tumor still reducing.

October, the patient received one treatment on the 3d of the month. She then left the city for some time and I did not see her again until December 8, when I found by examination that her pelvic organs were perfectly normal. The uterus measured 6 cm. in depth. The growth was imperceptible. The two menstruations passed while absent were perfectly normal. The patient was discharged cured. I see her frequently, and she remains in the most perfect health.

Case 9.—Large interstitial, partially submucous hæmorrhagic fibroid growth of the uterus, enlarging that organ, filling the pelvis below and extending nearly to umbilicus above. Thirty-seven applications of galvanism, 20 intra-uterine galvano-negative, 17 intra-uterine galvano-positive. Reduction of growth one-third. Other symptoms not relieved.

Mrs. S., widow, was referred to me by Dr. J. B. Sullivan, of Stanton, Michigan. Age 34, no children, no miscarriages, puberty at 14. Subjective symptoms: Excessive and exhaustive menstrual which lasts from four to ten days and is accompanied with excruciating bearing-down pains occasionally. Bowels constipated and often difficulty in urination. Bearing-down pain is complained of and the greatest difficulty in locomotion is experienced. Patient very thin and anæmic.

Objective symptoms: Large, regular, oval-shaped growth, filling the lower pelvis and extending within a couple of fingers breadth of the umbilicus is found upon bimanual manipulation. This proves to be an enlargement of the uterus, as the probe easily enters to the depth of 17 cm. or $6\frac{3}{4}$ inches. The growth is movable and apparently free from adhesion. Cervix large and patulous.

This patient was given at once the benefit of Apostoli's treatment. The treatments given before the first menstruation were all intra-uterine galvano-positive. The first menstruation was postponed for more than two weeks, when it did appear, however, it was as profuse as at the former one before any treatment had been given. The treatment was continued in this way: the positive applications being given immediately before menstruation, and the negative following menstruation, until twenty of the latter or negative, and seventeen of the former or positive, had been given. No attempt in this case was made at accurate concentration; in this case the large Apostoli platinum electrode being used internally and the current varying from 100 to 300 ma. While the growth decreased in size the hæmorrhage was not controlled, and at the end of about three months the patient reluctantly returned home for private reasons, with the assurance that she would return. She has not done so, however, and in response to my inquiries she writes that while the menorrhagia is no more severe than when she came to me, it is no better. Her general health and other symptoms are about the same.

While this patient was under treatment she had a number of attacks of uterine pains accompanied with expulsive contractions, which succeeded in expelling a number of pieces of a fleshy character. This upon examination proved to be of a fibromyomatous character. I decided from this and from subsequent examinations with a probe that a portion of the growth was submucous, and that through the efforts of the womb this was being forced into its cavity and its expulsion accomplished. This fact accounted for the poor success I had in checking the menorrhagia, although I believe with continued treatment the patient would have been relieved of all symptoms.

The entire growth while under treatment

diminished approximately one-third in size. The uterus was reduced in depth from 17 cm. to 15 cm.

Case 10.—*Large subperitoneal fibroid growth, about 8 inches in its long and 4 in its shorter diameter, with irregular contour, attached to the entire fundus and posterior wall of a slightly enlarged uterus. Thirty applications of galvanism. Symptomatic cure.*

Mrs. H., married, age 45, no children, no miscarriages, was referred to me by Dr. A. Reeves Jackson, Aug. 22, 1887. She first menstruated at 17, and was normal in this respect until about 12 years ago, when a slight increase in quantity of flow was noticed, which has gradually increased up to the present time. Now menstruation lasts from five to six days, is profuse, and is accompanied with considerable pain. Serious pressure on rectum and bladder is complained of, which is the source of greatest discomfort to patient and is the cause of her seeking relief.

Objective Symptoms: A solid fibroid tumor, 8 by 4 inches in diameter, occupying and dilating the upper portion of the vagina, completely fills the pelvis. Protruding from its lower portion and almost reaching the vulva is the cervix, from which can be traced above, the body of the uterus. Its canal, which is posteriorly directed, being 8 cm. or a trifle over 3 inches in depth. From the neck of the uterus the tumor extends as an irregular mass in all directions, pressing upon the rectum posteriorly and the bladder anteriorly, and is almost immovable.

Treatment.—August 4th, intra-uterine galvano-positive treatment, by means of the flexible intra-uterine electrode, requiring 110 ma. current, were given. In the early part of September two more galvano-positive treatments were given. The effect of these six treatments so modified the following menstruation that in the succeeding applications the galvano-negative current was employed entirely. During the remainder of this month and until the 15th of November 19 intra-uterine-galvano-negative treatments were given, when the condition of the patient was as follows: Menstruation for the first three months normal, general health remarkably improved. Pressure on rectum and bladder almost entirely relieved. Tumor reduced in size approximately one-third, and it has become quite freely movable. The uterus is less than 7 cm. in depth. From this time until December 15th, I varied the treatment and gave 10 intra-vaginal galvano-negative applications. The vaginal electrode being so placed as to cause the current to pass through the mass of the tumor situated behind the uterus. This was done in order to reach that part of the tumor which was inaccessible owing to the shallowness of the uterine canal by any other means save galvano-puncture, which operation I always seek to avoid if possible. The patient was at this time so much improved, that by my advise she discon-

tinued treatment, with the expectation of returning if any unfavorable symptoms should reappear.

Case 11.—*Interstitial, hæmorrhagic, painful myofibroma of the anterior wall and fundus of the uterus increasing its depth to $3\frac{1}{2}$ ins. or 8 cm. Thirty intra-uterine applications of galvanism. Depth of uterus reduced to $2\frac{1}{2}$ ins., general health improved, menorrhagia modified, other symptoms relieved.*

Mrs. J., æt. 32, married 9 years, 2 children, the youngest 6 years of age, has had two miscarriages, the last one occurring about 3 years ago. The present trouble dates from that time, and first manifested itself in frequent urination from pressure on the bladder. Soon after this the patient had a sharp attack of peritonitis, and from that time severe hæmorrhage has taken place at each menstruation, which has, however, been somewhat irregular.

This patient has been under the care of several prominent physicians.

Subjective Symptoms.—Menstruation profuse, lasting ten days; pressure upon bladder renders urination frequent and painful; locomotion difficult from general feeling of pelvic weakness; patient anæmic and discouraged. *Objective Symptoms:* Uterus large and congested, occupying about its normal position, depth $8\frac{1}{2}$ cm. or $3\frac{1}{2}$ inches. Upon the fundus and anterior wall of the uterus is a distinct thickening, which gives that organ the appearance of an acute ante flexion and increases its apparent depth about 2 inches.

The first treatment was given September 15, the flexible electrode 4 mm. in diameter requiring 100 ma. current being employed. From this time until Dec. 19, 30 intra-uterine treatments were given, the last four or five before each menstruation being galvano-positive, the rest galvano negative. This patient improved immediately in general health and nutrition. Menstruation from the first was modified, but was not at any time satisfactorily checked, before the treatment was necessarily discontinued. Notwithstanding this, the uterus was materially reduced in size, measuring 7 cm. or less than $2\frac{3}{4}$ inches, and the thickening in the anterior wall was diminished at least two-thirds. The pelvic symptoms, including pressure upon the bladder and constipation, disappeared. At this time, much to my regret, treatment was discontinued on account of removal from the city. The patient assured me, however, that I might expect her back should any of the old symptoms reappear.

Case 12.—*Large hæmorrhagic, interstitial, subserous, fibroid growth of the uterus. Twenty-one applications of galvanism. General health improved; pain and pressure on bowels relieved; tumor reduced one-third. Still under treatment.*

Mrs. B., age 39, married, three children, youngest child 7 years old, one miscarriage. Was referred to me by Dr. H. T. Byford, Sept. 21. The

tumor had been discovered by her family physician about two weeks previous to date.

Subjective Symptoms.—Difficulty in locomotion; bowels obstinately constipated; constant and increasing disurea; menstruation profuse and exhaustive; profuse leucorrhœa; constant backache and general feeling of bearing down.

Objective Symptoms.—Large unyielding growth, filling pelvis and lower part of abdomen, attached to the whole fundus and posterior wall of the uterus in such a manner as to greatly enlarge that organ. Depth of uterus 16 cm., or about 6 inches; cervix large and patulous; canal long, easily admitting a sound 5 mm. in diameter to its full depth, which takes first a posterior direction, afterwards curves anteriorly, and when withdrawn presents the appearance of one-third the arc of a circle. The uterus and tumor are movable, the latter fills the pelvis, and rises above it so as to considerably enlarge the lower abdomen. Measurement of umbilicus 39 inches, midway between umbilicus and pubes at most prominent portion of growth, 44 inches.

Treatment.—From Sept. 21st to Dec. 20th, 21 intra-uterine treatments were given. The internal electrode employed was of the flexible variety, 5 mm. in diameter, and had an active surface of 4 sq. cm., requiring a current of 100 ma. It was used as a positive electrode, in all, six times; as the negative, fifteen.

Results.—The general health of the patient commenced to improve immediately; first menstruation was sufficiently modified to greatly encourage her; pain and pressure in bowels soon greatly relieved.

Condition on Dec. 21, when temporarily discharged.—Tumor reduced fully one third; general health much improved; notwithstanding a considerable gain in flesh, the abdominal measurements are, at umbilicus, 38 inches, as against 39, three months ago, midway 40, as against 44. Depth of uterus reduced from 15 cm. to 12 cm. Menstruation normal; pressure on bladder and rectum greatly relieved; all pelvic discomforts gone; walks with ease.

The patient at this time was so much improved that I advised her to stop treatment for a time and await results, and to return should it prove necessary.

Case 13.—*Myofibroma of the anterior portion of the neck and body of the uterus, 7 cm., or a little less than 3 inches in diameter. Sixty-one applications of intra-uterine negative galvanism. Cure.*

Mrs. T., age 27, married five years, no children, no miscarriage.

Subjective Symptoms.—Frequent and difficult urination; profuse, but not exhaustive menstruation, with much pain during the latter portion.

Objective Symptoms.—Depth of uterus 8 cm., or $3\frac{1}{4}$ inches; sound passes in the direction parallel to the axis of the body. On the anterior wall of

the body and neck of the uterus is a hard mass, or tumor, which would measure, approximately, 7 or 8 cm. in diameter, of a smooth, regular exterior and quite freely movable with the uterus. Trouble has been developing for about four years.

The diagnosis in this case was first made by Dr. A. E. Small, who had during my absence taken charge of my clinic at the S. S. Dispensary, where the patient presented herself.

The first treatment was given June 7th. An Apostoli intra-uterine platinum probe was inserted to the bottom of the uterine canal and connected with the negative pole of the battery. The large abdominal electrode was employed to complete the circuit by applying it over the tumor on the abdominal surface in such a position as to insure the passage of the current through the mass of the growth. A current was then gradually turned on until 200 ma. was reached. This was allowed to pass for about five minutes, the patient experiencing no discomfort. Considerable discharge of a watery character took place from the uterus and a bubbling of gas was noticed around the staff of the electrode as it made its escape through the fluid. Eleven of these treatments were given during June, a current being tolerated a number of times of as high intensity as 500 ma. The tumor showed a tendency from the beginning to reduce rapidly in size. The menstruation this month was rather more profuse than usual, but painless.

July 15, intra-uterine negative treatments were given. Highest intensity employed, 300 ma. No discomfort, except tenderness of the skin; growth rapidly decreasing; uterus 7 cm.; menstruation normal.

August, fourteen intra-uterine negative treatments given. Highest intensity 2.50 ma. Patient declares herself well; growth appears simply as a thickening of the anterior wall of the uterus, or as an anteversion; pressure on bladder gone; menstruation rather profuse.

September. It was with difficulty that I could convince the patient that it was still necessary for her to receive treatment. A few were given this month by Dr. Wimermark. Highest intensity 200 ma.

October. Patient with difficulty induced to take ten more treatments.

Discharged October 24th. Depth of uterus 6 cm., or about 2¾ inches; thickening of the anterior wall no longer perceptible; all other unnatural symptoms have disappeared. Result: cure.

Case 14.—Large, polypoid, sub-mucous growth, attached by a small pedicle to the interior of the fundus of uterus and protruding at the cervix. A few surface applications of galvanism, made by means of a cervical electrode. Result: Nothing appreciable, recommended operation.

This case was soon discovered to be one in

which ergot or an operation was better adapted to give prompt and permanent relief. Consultation with Dr. Mann, of Buffalo, was therefore advised, and the growth was successfully removed.

Case 15.—Myofibroma of fundus and posterior portion of uterus, accompanied with menorrhagia. Twenty-three intra-uterine applications of galvanism. Cure.

Mrs. M., æt. 32, three children, youngest 3 years of age, consulted me at the South Side Dispensary some time in the early part of October, 1887.

Subjective symptoms: General weakness and increasing difficulty in locomotion. Menstruation profuse and exhausting in amount, and accompanied with severe contractive pain; duration about eight days. Constipation has been of late a distressing symptom. General pelvic pressure and painful bladder symptoms are complained of. These symptoms have been getting worse and more aggravated for about two years. Appetite and digestion fair.

Objective symptoms: Cervix uteri large and patulous. Canal large and easily followed with flexible sound to the depth of 11 cm., or 4⅓ inches. Course of sound for about 2 inches parallel with axis of pelvis, then takes a sudden bend anteriorly to the bottom of the uterus. In a bimanual manipulation the uterus presents the appearance of a 3½ months' pregnancy, smooth and movable. The greatest thickness of the walls is in the fundus and posterior portion of the uterus below the fundus, although the whole organ is considerably hypertrophied. The uterus proper is quite decidedly anteverted, as shown by the probe.

This patient, commencing treatment in the middle of October, received twenty-three applications up to the middle of December. The internal electrode employed was of the flexible variety, 3 mm. in diameter, with an active surface requiring a 100 ma. current. The first six treatments given were of the intra-uterine positive, the remaining seventeen were intra-uterine negative. The current was well tolerated and the patient, judging from her faithful attendance, was not displeased with the effect. Menstruation was markedly modified for the better at its first appearance after treatment was begun. The general nutrition of the patient commenced to improve at once, and after the first month locomotion was accomplished with much greater ease, and the pelvic symptoms were greatly relieved, including the constipation. In this case a peculiarity was noticed in there being a much larger flow of clear watery fluid from the uterus during a negative intra-uterine application than is usual. At first this flow was very profuse, sometimes filling the speculum during a treatment. This watery discharge, however, gradually became less and less as the treatment progressed, until finally it was no more than in ordinary cases.

The recovery of this patient was uninterrupted, and when she received her last treatment, December 24, she was in the following condition: Uterus reduced fully one-half in size—its depth being reduced from 11 to 8 cm. The abnormal thickening of the fundus and sides of the organ had entirely disappeared. The large and patulous cervix was reduced to normal, and the discharge from the cervical canal ceased. The uterus is movable and menstruation painless and normal in quantity, lasting but three days. Constipation has disappeared and the pressure on bladder is entirely relieved. Patient is in better health than at any time since birth of first child.

GENERAL SUMMARY.

1. A means of generating a continuous current of electricity of steady and uniform character, that can give an actual current strength through a resistance of 200 ohms, of 500 milliamperes, is necessary in order to obtain all the benefits of this treatment.

2. Fibroid tumors of small size can be completely absorbed by the proper application of strong currents of galvanism.

3. Hæmorrhages from hæmorrhagic fibroid tumors can be promptly cured by the local coagulating effect of the positive pole when it is applied intra-uterine. Severe neuralgias so often accompanying these troubles can invariably be relieved by three or four applications of this treatment.

4. When the cervical canal cannot be entered by any form of intra-uterine electrode, flexible or otherwise, after repeated trials, a negative galvano-puncture should be made into the presenting part of the obstructing mass of the tumor, and an artificial canal opened, which is to take the place of the impenetrable uterine canal in all subsequent treatments.

5. The intra-uterine electrode should in all cases be negative, unless there is hæmorrhage or excessive leucorrhœa, when the positive pole is always required. The same patient, may, however, present symptoms demanding the use of both poles at successive operations.

6. The strength of the current should depend entirely upon the amount of active surface of the internal electrode, and should be 25 milliamperes for each sq. cm. of active surface in actual contact with the endometrium. If more is used the concentration of the current will be sufficient to cause troublesome cauterization, if less is used the concentration at any one point will not be sufficient to cause the necessary coagulation for checking hæmorrhage.

7. The duration of the treatment should be five minutes of the maximum current required.

8. The number of operations is necessarily dependent upon and influenced by the result to be accomplished. A severe hæmorrhage can be

checked, and symptomatic relief can often be accomplished by four or five séances, while a general reduction of the tumor necessitates many operations, varied of course, according to the size and location of the growth. In some cases of large multiple tumors a relief of symptoms, or symptomatic cure, must be accepted as a substitute for an actual cure.

9. The operation should be intra-menstrual, if possible, if hæmorrhage is continuous, however, operate during flow. The séances can occur as often as every day with the system of concentration adopted that enables one to attack different portions of the canal at succeeding treatments, or it can be given with advantage as few as once a week.

10. Since the adoption of the flexible intra-uterine electrodes and Dr. Apostoli's vaginal galvano-puncture, extra-uterine puncture should be regarded, if at all, only as a last resort.

11. Galvano-puncture needles, and the internal electrodes, should be constructed of material that is not injured by coming in contact with strong carbolic acid, or 1:1000 bichloride mercury solution. All internal electrodes should be thoroughly scrubbed with a nail brush and soap and water after each application, and allowed to remain in one or the other of these standard antiseptic solutions until they are to be employed again, when they should be washed in a weaker solution of the same before using. Before a vaginal puncture is made the vagina should be thoroughly wiped out with a 1 to 3000 bichloride solution.

12. There is no excuse for any percentage of mortality in the proper application of this treatment. While Dr. Apostoli has had two deaths in 275 cases, he candidly admits they were due to avoidable accidents rather than to any legitimate procedure of the operation.

13. In experienced hands, and by the adoption of the present means of concentration, the most delicate and sensitive patient can receive, without experiencing any severe discomfort, all the benefits to be derived from this valuable treatment.

163 State Street, Chicago.

NIGHT SWEATS.—Few practitioners appreciate the exceedingly great value of agaricin as a remedy in night sweats, especially those of phthisis. The most profuse sweat is checked almost by magic, with a single dose. It operates by diminishing thirst and increasing the secretion of urine. The dose may be pushed to the extent of one grain in the course of twenty-four hours. The single dose for an adult is from one-eighth to one-fourth of a grain.—*Technics*, No. 8. Boston.

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