

MEDICAL AND SURGICAL CASES TREATED BY ELECTRICITY.

No. I.—MEDICAL CASES.

The following medical cases will serve to illustrate certain features in electro-therapeutics that are not yet fully recognized by the profession, even among those who make considerable use of electricity in practice. It is possible that these reports may be read by some who are in the habit of using both currents of electricity, and who have acquired sufficient skill to enable them to confirm or disprove the results here claimed. General practitioners have continually under observation cases that the specialist sees but rarely, and if he happens to be familiar with electrical applications, may, if he will but take the pains, assist materially in advancing the cause of electro-therapeutics. Acting on the theory that at least a part of the pathology of diabetes rises in the brain or spinal cord, I have treated ten cases by galvanization. The first one treated was the following:—

Diabetes Mellitus, Traumatic Origin, in an Aged Patient; Rapid Relief of all the Symptoms, and Apparent Arrest of the Disease under Central Galvanization; Subsequent Attack of Hemiplegia.

J. D., a farmer, aged 76, was referred to me, January 30, 1873, by Dr. J. H. Raymond. The patient had always been active, laborious, and well, until two years previous, when he fell ten feet in a barn, struck and hit on his side. That same night came pain in the nipple, and a very profuse flow of urine. At one time he passed as high as two quarts and three pints daily. It was ascertained that the urine contained sugar, and by medical advice he had adopted Camplin's diet, and under Dr. Raymond had taken carbonate of soda with advantage.

The symptoms at the time the patient came to me were as follows: There was headache, bad taste in the mouth; the urine had a specific gravity of 1024, and he was obliged to rise in the night to pass water; about two quarts were passed daily; there

was considerable muscular debility, so that a short walk was fatiguing.

On the theory that the disease was in the spinal cord, or at least in some part of the central nervous system, I began to use central galvanization, with immediate results. After the first application he began to be stronger, and after a week it was no longer needful for him to rise at night to pass water. The specific gravity of the urine soon went down to 1019, at which point sugar could still be detected. The diet of the patient, and his general manner of life, was the same as before. Sugar was never entirely expelled from the urine, but in strength the patient so much improved that he could walk several miles daily. The headaches were felt no more, and the bad taste was much mitigated. He returned to his home and to his occupation, and was able to work more or less for six months, when he was taken with hemiplegia.

Dr. Burkner informs me that he has similarly treated a case of diabetes, and has from time to time examined the urine and estimated the quantity of urea. He has confirmed the experience above recorded, and besides, has shown what I do not attempt, that the quantity of urea diminished very markedly under the treatment.

In the following much severer case the apparent results of treatment were less decided:—

Diabetes Mellitus, Two and a Half Years' Standing, Apparently Caused by a Fall, Complicated with Various Nervous Symptoms; Temporary Benefit from Central Galvanization.

Mrs. L., a married lady, under middle age, was sent to me, March 4th, 1873. Two and a half years before she had a severe fall, which produced a concussion of the spine, and laid her up for a week. In a few months came on excessive thirst, constipation, and sugar in the urine. She had been

through various forms of treatment, and confined herself to bran-bread, and was then drinking Bethesda water, which seemed to do her good. Her condition was as follows: specific gravity of urine, 1049; six gallons passed daily part of the time, and when she paid no regard to her diet. Considerable facial neuralgia, great thirst, a feeling of aching and stiffness in legs, with pains resembling growing pains; insomnia, partly owing to the fact that she was obliged to get up several times during the night to pass water; and tenderness of dorsal and lumbar vertebrae. Treatment by central galvanization faithfully used brought down the specific gravity of the urine to 1040, but never lower than that, enabled her to pass the entire night without rising to make water, and relieved many of her general nervous symptoms, and this was all it accomplished.

Anosmia, loss or impairment of the sense of smell, is relieved by electricity, and sometimes permanently cured. Internal applications are better than external applications, and the galvanic current is preferable to the faradic.

Chronic Rhinitis, with Anosmia and Profuse Secretions; Immediate Relief under Internal and External Galvanization.

Mr. H., a gentleman of middle life, was referred to me by Dr. St. John Roosa, October 5th, 1872. The patient was suffering from "catarrh," so-called, most severely; the secretion was very abundant. The anosmia was quite profound, and the sense of taste also was considerably affected. The symptoms had been worse during the past two weeks. I gave treatment by internal galvanization with a mild current, six cells, by means of the nasal electrode, the cathode internally. The nasal passages were sensitive, and only gentle currents and short application could be borne. External application also was employed, one pole on the bridge of the nose and the other in the hand. Relief followed the next day; for the first time in two or three weeks, he could smell fragrant substances. He continued to improve under a number of applications, when I lost sight of the patient.

In the above case there was not, so far as I know, any marked improvement in the discharge or in the character of the ulcers from which the discharge proceeded. The case illustrated the fact I have often ob-

served, that the anosmia yielded long before the inflammation with which it is associated.

Cases of asthenopia are frequently benefited by local faradization or galvanization. I long ago expressed the belief that more could be done for asthenopia than for almost any other form of disease of the eye.

Asthenopia, Nine Years' Standing; Temporary but no Permanent Relief from Localized and General Faradization and Central Galvanization.

Miss W., aged 25, was referred to me, December 11, 1872, by Dr. E. G. Loring.

Since puberty the young lady, who was of a pronounced nervous temperament, had suffered from weakness of the eyes. She could read but little without pain. Before the menstrual periods she was always worse. There was ovarian tenderness, resulting probably from congestion due to a cold taken during the menses. This tenderness, which had existed two months, made it quite difficult for her to walk long distances, and apparently the weakness of the eyes was aggravated thereby.

An application of localized electrization made her eyes feel better for a day or two. This method of treatment was continued for a month, though varied somewhat by central galvanization and general faradization with a view to improve her general condition. The improvement was not satisfactory; temporary, and I believe permanent, relief was gained.

There is no form of paralysis that serves so well to illustrate the differential action of the two currents as facial paralysis.

Facial Paralysis of Right Side, Caused by Exposure to Cold; Permanent Recovery under Local Galvanization after Failure of Faradization.

Mr. E., a gentleman of middle life, was referred to me November 29, 1871, by Dr. Wm. K. Brown.

The patient had been exposed, a number of weeks before, to a cold wind while riding; there followed paralysis of the right side of the face. For this condition Dr. Brown had used faradization without much effect.

I found on examination that the patient could move the muscle of the diseased side but slightly, and under a strong faradic current there was no response. Six weak cells of the galvanic current caused ready contractions of the *corrugator superciliaris*, the *orbicularis* and the *zygomatici*.

After one week of treatment, six applications, the patient could close the eye immediately after the application, and could slightly corrugate the forehead; at the angle of the mouth no movement was possible. The slight improvement just after the sitting lasted, in its full extent at least, but a short time. December 26, after sixteen applications, the patient could slightly move the angle of the mouth. January 24, after thirty applications he was so nearly well that treatment was abandoned. Subsequently I saw the patient, and he was entirely restored.

In the above case the faradic current alone,

even if persevered in, would probably have accomplished little or nothing. And yet cases of facial paralysis of a similar character are sometimes treated by faradization and then abandoned, and then electricity loses ground in that immediate neighborhood. I will not say that faradization long continued may, by its mechanical effect and general influence over nutrition, aid the case of a peripheral facial paralysis, even when it produces no contraction; indeed, I suspect that it may have such an effect; but so long as we have the galvanic current at command it is not necessary to wait the slow action of such an experimental expedient.

NO. II.—SURGICAL CASES.

Epithelioma of the Face, Originating in an Old Scar, Six Months' Standing, Removed by a Combination of Electrolysis of the Base and the Galvano-Cautery.

Captain D. was brought to me, April 27th, 1873, by Dr. Fessenden. The patient had a tumor that appeared to be an epithelioma, about the size of a small walnut, over the zygoma. It had developed from an old scar that had existed from childhood. When he was first brought to me the tumor had been in existence six months. It had been treated by caustics but rapidly recurred. I decided to treat the tumor by *electrolysis of the base*, combining with it the galvano-cautery, if necessary or convenient, and shorten the operation.

April 30th I operated, assisted by Dr. Fessenden, who gave the anæsthetic for ten minutes, with eighteen zinc carbon cells. I used my long cutting needle, passing one connected with the positive pole *under* the tumor near the edge, and another long cutting needle connected with the negative pole, also under the tumor, and parallel to the positive needle. The electrolytic action was moderately strong, and the growth was rapidly loosened. The positive needle became fixed in the tissue where it was imbedded, through the oxidization, as is always the case with the positive needle, while around the negative needle a yellowish foam appeared, caused by the mingling of the hydrogen evolved with the blood. The needle was very loose in the tissue, and I worked

it slowly to the right hand and left until the tumor was undermined by the electrolytic action, and nothing removed but a portion of the skin. I completed the operation by a short wire connected with Byrne's galvano-cautery battery. After the tumor was removed, I worked up the base, partly with the needles and partly by the heated galvano-cautery wire.

Both needles, positive and negative, were plunged into the base and edge of the tumor, into healthy tissue, until all was bloodless, charred and dry. Scarcely any blood flowed during the operation.

The patient was soon able to leave the operating room. Cold water dressing only was used. Some sloughing followed, and satisfactory granulation. In six weeks the sore had completely healed, with a moderate cicatrix, and at the date of writing, February 1st, 1874, ten months from the time of operation, there are no signs of recurrence. The growth was examined microscopically by Dr. Ormiston, and by him pronounced malignant.

This method of *working up the base* I devised in 1871, and have used it on a large variety of tumors, epithelioma, cystic growths and schirrus, and in different localities, as the face, neck, rectum, vagina and breast. It is, of course, indicated only in malignant growths, by which I mean growths that recur after removal. Benign tumors, as naevi, certain forms of cystic tumors, and goitres, are best treated by the or-

dinary method of electrolysis, that is by plunging the needles into the body of the tumor.

When the method of working up the base is used, the body of the tumor may be removed by the knife, the ligature by enucleation or by the galvano-cautery wire. So far as the results are concerned, it matters not what method of removal is used. The important point is to thoroughly *electrolyze the base of the tumor and the surrounding tissue*, so that the chemical changes caused by the current may reach not only the diseased tissues, but also those tissues that are, so to speak, passing out of the healthy into the diseased condition.

I do not profess that this method, or any other method of electrolysis, has any constitutional effects against the cancerous diathesis, if we are to suppose that such a diathesis exists. Its effect is chemical and local. Its chemical effects are complex, and are essentially different from the effect of caustics or chloride of zinc, which have been successfully used in these cases.

Destruction of tissue is only one of its effects, and one which is of the least importance. Electricity acting on the tissues decomposes them, as no other force or agent can do, and with a variety of primary and secondary results, which can be only in part explained.

From my present experience with this method of working up the base, these provisional conclusions seem to me justifiable.

1. Malignant growths, epithelioma, cystic and schirrus, when thoroughly treated by this method, do not recur as readily as when treated by other methods, if indeed, they recur at all. A longer time will be needed to settle this question beyond dispute, for the obvious reason that after ordinary operations, a certain percentage of malignant growths do not recur. Several of the cases that I have treated by this method had been previously operated on by the knife and ligature, and the recurrence had been very rapid; these cases I have kept watch of since I operated on them by this method, and from times ranging between three years and three months, and at the present date there has been no recurrence in any case where it was possible to thoroughly use this method. In hopeless cases of cancer of the vagina and rectum, where it was impossible to use this method in its completeness, there have been recurrences;

but even in these cases the rapidity of the healing has been most gratifying, and the growths have been kept back much longer than where the knife and ligature were used alone.

2. More rapid and satisfactory healing. This is observed, as I have stated, not only in the curable, but also in the incurable cases. In some cases, although the sloughing is quite extensive, the cicatrix is not large.

3. Less probability of shock and pyemia. These two bad results of ordinary operations have not yet occurred to me in any of my numerous experiments with the method of working up the base. In the case where I yielded my method to the knife, the patient died of shock, and in another case, where I yielded my method to enucleation, and neglected to work up the base, the patient died of pyemia.

I give these conclusions with reservation. I am still extending the field of my researches, and am now treating schirrus of the breast by the same method; as these tumors are almost sure to recur after ordinary operation, it will not take long to determine whether the advantages of my method are as great as I have suggested. The ordinary method of electrolysis does not accomplish much in schirrus of the breast, except to relieve the pain; but the pain can be relieved by simple external galvanization, without the use of galvano-puncture.

When *large* malignant tumors are treated by this method, it is a saving of time to remove the growth with a knife, unless, on account of feebleness of the patient, a shock may be apprehended, and then work up the base with my long cutting needle, or with the harrow electrode that I have devised for that purpose. When the growths are *small* they will fall off by the dissolving influence of the electrolysis, and the knife is not needed.

The following case illustrates what can be done for the relief even of hopeless cases of schirrus of the breast, by external galvanization alone.

Schirrus of the Left Breast, Apparently Following Injury; Some Subsidence and Relief of Pain Under Local Galvanization.

Miss H., a maiden lady, about 35, residing in Springfield, Mass., was brought to me October 16th, 1871, by S. J. Holley. Three years before she fell and struck on her left

breast; abscess followed; then a hard lump appeared, then pain arose, then a tumor of considerable size was manifest, that was declared by a good surgeon to be schirrus. This was removed; then a tumor appeared in the right breast, subcutaneous in character. At the time she presented herself to us there was a reappearance in the left breast, and a subcutaneous tumor in the right, and some swelling on the breast bone between the breasts.

Localized galvanization of the tumors, and central galvanization to affect the nerve supply of the breasts, were used for two weeks, with the effect of relieving the pain and causing the tumor of the right breast to grow evidently smaller and softer. The patient soon left town, and when I next heard from her she was very feeble. She probably died of exhaustion. I had not at that time fully developed the method of working up the base, else I might, perhaps, have tried it, although the tumor was a recurrence.

In the following case the disease was apparently arrested by external treatment; at the date of writing the patient is still tolerably well.

Schirrus of Left Breast; Eight Years' Standing; Feeling of Weight and Pressure; Relief of the Unpleasant Symptoms Under Localized Galvanization, Faradization and Central Galvanization.

Mrs. M., of Philadelphia, consulted me October 24th, 1871. The lady was of middle life, and the meno-pause had recently occurred. For eight years she had been annoyed by a tumor that very many eminent authorities had pronounced schirrus in the left breast. It began with a small hard lump, and gradually but very slowly increased. The pain had never been very violent, but there was a feeling of weakness, of pressure and of debility in the left breast, that at times was distressing. There was a cardiac difficulty which aggravated the nervous symptoms. There was also insomnia and debility.

About a month before she consulted me there had been various signs that the tumor was on the point of making a new departure, and the patient was considerably alarmed. I treated her exclusively by external galvanization, with mild currents, about twenty-five times. The applications were made five or six times a week. The uneasy sensations connected with the tumor

were relieved, and there was apparent arrest of its progress.

I have since heard from the patient, and the tumor, though still existing, does not cause her serious trouble, although the general condition of the patient is not good.

In cases like the above, it is, of course, impossible to tell just how much the apparent arrest of the tumor is the result of the treatment. There are some cases that of themselves stop at a certain stage, and are stationary for years. If this patient should ever reach that stage where operation would seem to be imperatively required, the method of working up the base would be appropriate.

Cystic Tumor of the Breast Treated by External Galvanization and Electrolysis; Great Reduction in Size and Apparent Cure.

Mrs. P., a lady of middle life, consulted me December 3d, 1873. The patient had a tumor in the left breast, of the size of a small orange. About two months had passed since it was first observed.

Both her family physician and another surgeon of eminence regarded the tumor as schirrus, and advised its removal.

The patient, I may remark, traced the origin of the growth very directly to a severe bruise of the breast from striking against a bed-post. When I first saw the case the tumor could be easily felt and grasped between the fingers, and seemed quite hard. The nipple was but slightly affected, and there was no involvement of the glands in the axilla.

There had been little or no pain, the tumor had not extended to the skin, and there was no discoloration; except by examination the presence of the growth would hardly have been suspected. The growth was quite movable.

The patient was of a very nervous temperament, and had suffered much from neuralgia. In spite of the lack of very severe symptoms I concurred in the opinion of her previous advisers, that the tumor was schirrus. The patient so dreaded the thought of the knife that she wanted to give electrical treatment a good trial.

I began with local external galvanization with moderate currents. After one week's treatment the tumor seemed looser, softer in portions, and a trifle smaller. Subsequent treatment added nothing to this apparent improvement. I therefore resolved to use galvano-puncture.

December 31st, I inserted two needles into the part of the tumor that was most superficial; one needle was connected with the positive and the other with the negative pole.

Ether spray was used by Dr. Rockwell before the needles were introduced. The needles had not been in position more than five minutes when a fluid as colorless as water began to flow out of the places where they were inserted, and on pressure, the quantity that came away was much increased, and more or less flowed out during the whole operation, which lasted fifteen minutes.

When the needles were withdrawn, and pressure was used, still more fluid exuded, and the tumor had become reduced two-thirds in size. The tumor was evidently *cystic*.

January 2d and January 8th I again operated with my long cutting needle, without assistance and without anæsthesia, so as to reduce the tumor to a minimum, and if possible cause absorption or atrophy.

At the second operation a less quantity of fluid exuded, and still less at the third operation. The patient left for home. I occasionally hear from her, and up to the date of writing the tumor has not resumed its original size, and does not in any way trouble her.

In the above case one of three results are possible.

1st. The tumor may remain comparatively small, causing no annoyance to the patient. This result I have seen in other cystic tumors (though not in the breast), from the same method of treatment that was adopted in the present case.

2d. The tumor may again fill up with fluid, and may require a repetition of the same treatment.

3d. It may take on the schirrus form. It is, of course, possible that the cells of the growth may already be of a schirrus character. Even if it should prove to be a schirrus

growth it would not follow that removal would be at once indicated.

I have seen one case where a tumor of an undoubtedly schirrus character kept almost stationary for eighteen years. It was then removed, and the base was worked up by electrolysis, for the reason that it was becoming adherent and painful. I have seen another case of malignant cystic tumor, where early operation was advised and adopted, and although every feature in the case was favorable for an operation, the growth recurred immediately, and the patient died. The above case, I may further remark, is of interest to surgeons as well as electro-therapeutists, as illustrating the necessity of preliminary exploration in all doubtful cases. None of us suspected that the tumor was cystic until the fact was revealed by galvano-puncture.

If in the above case there should ever be a rapid and ugly recurrence of the tumor, with threatening indications of any kind, the method of working up the base would be indicated, the knife or the galvano-cautery being used to remove the body of the growth.

I have here no space to discuss the rival theories of malignant growths.* I may simply remark that reasoning backward, from therapeutics to pathology, all my observations thus far seem to confirm the theory that cancer is a *local* disease, and excited by *local* injury of some kind, as blows, falls, and exposure to cold. The *tendency* to take on cancerous degeneration, on exposure or injury, may be constitutional and hereditary, but each manifestation of the disease is, for all practical purposes, local, and may, when taken in reasonable time, be cured by *thorough* local measures such as I have here described.

* For the views of recent pathologists on this subject see "A Lecture on the Structure of Cancerous Tumors, and the Mode in which Adjacent Parts are Invaded." By I. I. Woodward, Assistant Surgeon U. S. A. *The Toner Lectures of the Smithsonian Institute*, Washington, November, 1873.