THE TREATMENT OF NEURITIS BY ELECTRICAL METHODS.

BY

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It has been my lot to treat, by electrical methods, a great number of cases of neuritis affecting the trigeminal nerve, the branches of the cervical and brachial plexuses, especially the external and internal cutaneous nerves of the arm, the intercostal nerves, and the sciatic nerve. The result in the great majority of cases has proved most gratifying. With rare exceptions, relief of pain has been obtained, and in not a few a complete and permanent cure has been effected. The method I have employed for twelve years has been the use of high-frequency currents. Within the last few years I have employed also ionic medication, recommended by Professor Leduc of Nantes, and introduced into this country by Dr. Lewis Jones of London, using the method either alone or in combination with high-frequency currents.

As almost invariably the patient's general health is depressed, it is well in using high-frequency currents to pass through his body 500 to 800 milliampères of current as he reclines on the condenser couch. No better general tonic can be found. For the relief of the neuritic pain the skin of the affected area may be gently stroked by the hand of the operator as he holds one electrode, while the patient grasps the other. If this form of electrical massage is practised over clothing, the pain is apt to be slightly increased, at least for a time. Occasionally, if the pain is very acute, the use in the first place of the hot-air douche is advisable. Another way of applying high-frequency currents locally is by means of the brush discharge, which is painless, unless careless sparking is allowed.

The method of employing ionization is clearly explained in Dr. Lewis Jones's recent book on *Ionic Medication*. Of the various drugs employed, I have obtained the best results from the application of a 2 per cent. solution of quinine hydrochloride. The electrodes are composed of chains of zinc, and large pads of 16 plies of lint soaked in the solution are placed between the electrodes and the skin of the patient. It is advisable to wash the portion of skin to be treated before applying the pads. The electrode lying on the pad soaked in quinine hydrochloride is connected with the positive pole, as alkaloids like quinine have positively charged ions with an affinity for the negative pole, and are repelled from the positive. This electrode is applied to the affected area, and under the influence of the continuous current the quinine is introduced through the skin into the body. The indifferent electrode, resting on a pad soaked in salt solution, is connected with the negative pole, and may be applied to any convenient spot on the same side of the body. The pads with their electrodes should be bound firmly to the body by bandages.

The use of the ordinary battery is not advised, as the break between each cell or group of cells causes unnecessary pain to the patient. A switchboard, connected with the main supply or with accumulators, is preferable. A milliampèremeter should be in the circuit.

The current must be very slowly turned on. Even 3 milliampères will cause a little discomfort at first, but in a few minutes the resistance of the skin will be overcome, and gradually the current may be increased till 50 to 100 milliampères are registered. The treatment lasts for thirty minutes, then the current is reduced to zero as slowly as it was applied. It should be repeated daily, unless the skin is tender. Redness of the skin in contact with the pads is observed, but is soon removed by the use of a dusting powder.

CASE I.—A medical friend, suffering from neuritis of a month's duration, who had taken many drugs, was induced to place himself in my hands, though he was inclined to look on electrical treatment as a species of "quackery." After treatment he readily admitted that he was not only relieved of the pain, but "absolutely cured," and though four years have elapsed since he was subjected to high-frequency currents, he has not experienced the slightest return.

CASE II.—A second member of our profession who had experienced acute suffering for three weeks from neuritis of the left cervical and brachial plexuses, the pain reaching to the fingers, was cured with high-frequency currents in a month, even though his visits were somewhat irregular. Previously

he had tried, without avail, fly and mustard blisters, fomentations, aspirin, sodium salicylate, codeine, and antipyrin. Hypodermic injections of morphine had relieved pain temporarily, but did not cure the neuritis. It is now three years since he was treated. He has lately written to me that he has had repeated minor attacks of his pain lasting for a few days, but nothing like a violent seizure.

CASE III.—A third doctor, no longer young, came to me for treatment on account of neuritis of the right sciatic nerve of four weeks' duration. He required twenty-seven visits. In the end, however, not only was his pain removed by high-frequency currents, but his general condition was greatly improved. Three years afterwards I met him walking briskly uphill, looking several years younger than when he first came to me. He told me that he had had no return of the pain.

CASE IV.—A farmer's wife, suffering from trigeminal neuralgia of the right side for twenty years, was relieved of her pain by high-frequency currents. Six months afterwards, when I last heard of her, there had been no return of any discomfort.

Many similar cases cured by high-frequency currents could be adduced. With regard to ionic medication, I may, perhaps, be allowed to quote my own case.

CASE V.—In November, 1913, I began to suffer pain on the left side of my back, which I considered to be simply lumbago—an easily cured trouble. The renal region was skigraphed, but no shadow of calculus was detected. Dr. Ernest G. Fortune, who attended me, discovered a painful area to the left of the twelfth dorsal vertebra, and traced the pain along the course of the left twelfth dorsal nerve. Only those who have experienced the pain of neuritis can realize the suffering it causes. The pain came on at different times, though chiefly at night in the form of violent spasms, which seemed to be synchronous with the pulse beat. Very hot baths, liniment fomentations, and rest in bed gave considerable relief, but cure was only effected by quinine ionization.

CASE VI.—A young lady was sent to me in March, 1913, by Dr. Stevenson, of Larkhall, suffering from neuritis of the right shoulder, which had lasted intermittently for a period of eight years. The pain was chiefly felt at night. At first high-frequency currents were employed and later on ionization with sodium salicylate. Complete cure resulted after fifteen visits. There has been no return of the pain, though it is two years since treatment was discontinued.

CASE VII.—Her brother came to me a few weeks ago with neuritis of the branch of the left brachial plexus which supplies the infraspinatus muscle. In this case cure was obtained by quinine ionization after seven visits.

CASE VIII.—A lady, aged 22, with neuritis of three weeks' duration, affecting the external cutaneous nerve of the right arm, was completely and, so far, permanently cured after eleven applications of quinine ionization.

CASE IX.—A married lady was sent to me last autumn by Dr. R. O. Adamson and Dr. Ernest G. Fortune. The pain over the left shoulder was intense, but relief was obtained and cure effected by a combined treatment, in twenty-four visits, by high-frequency currents and quinine ionization.

It would prove fatiguing to the reader to prolong the notes of other similar cases, but from these already referred to it may be realized that by electrical methods relief and cure may be successfully obtained even in cases of extreme neuritis.

INTERLOBAR EMPYEMA.*

BY

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INTERLOBAR empyema, that is, an accumulation of pus in the fissure between the lobes of the lung, has not received adequate attention in the textbooks. Dr. West, in his excellent treatise on diseases of the lungs, only gives a brief mention to it, and says that it is difficult of diagnosis. Sir William Broadbent said that he had seen several cases in which he formed the opinion that this condition existed, but only two in which the opportunity had been afforded of verifying the diagnosis by operation. He had not met with an example in the *post-mortem* room during his long connexion with a London hospital.

Empyema in the interlobar fissure would probably make its way into the general pleural cavity. If localized it might make its way to the root of the lung, and as the abscess increased the fluid might tend to split the fissure in that direction, and gain access to the primary divisions of the main bronchus and be discharged. This was what took place in the case recorded below.

If the abscess discharges into the pleural cavity as the fluid accumulates, it causes the lung to shrink, first from the removal of the negative pressure and later from the

* Read at a meeting of the Portadown and co. Down Division.

actual pressure of the fluid, till the lung is ultimately flattened around its root against the mediastinum. When this condition exists the pus would not be likely to gain access to a bronchus. If the abscess occurred on the left side it might burst into the pericardium.

My son, who was a medical student, returned from Dublin for his Christmas holidays. He had always been a viry, healthy boy and was never sick, taking great interest in football and all school games. On December 23rd he had a rigor and his temperature went up to 104°. From this date until January 18th his chart resembled a case of typhoid fever in the third week. He had moist râles in the chest, with a little cough and expectoration. On January 9th the temperature rose suddenly to 105°. He was delirious all night and had great perspiration, with pain in the right lung and increase of expectoration. This, I think, was the start of the abscess. The pain gradually increased, with incessant cough and perspiration so copious that blankets had to be changed frequently.

Dr. Calwell saw him on January 10th, and we agreed to have a vaccine prepared. He received the first injection on January 12th and the second and third on January 15th and 19th without any beneficial result, except that the sputum greatly diminished.

Dr. Calwell saw him again on February 6th, when we explored the chest front and back on the right side, but only got about an ounce of healthy pleuritic fluid at the back. The physical signs were slight impairment of resonance, with imperfect entry of air, which varied from day to day; the way in which the signs skipped from the upper to the lower and from the lower to the upper lobe was remarkable. This, I believe, was due to the contents of the abscess pressing upwards or downwards as the position was changed. Dullness was, however, found behind the scapula, and from this to the axilla, where it became very noticeable.

This was his condition until February 11th, when he experienced a sudden choking and suffocating sensation, and coughed up about 4 oz. of fetid pus, which was almost a pure culture of streptococci. The pain was greatly relieved and he could lie on his right side, which up to this was impossible. The cough and expectoration from this on was almost incessant, and his mouth and throat got into a septic condition, covered with ulcers and very fetid. As he was losing ground rapidly, we decided that his only chance was to have the abscess drained. On February 19th I removed him to a nursing home in Belfast, and, with the assistance of Drs. Calwell, Fielding, and myself, Mr. R. Campbell explored the lung and got pus in the anterior axillary line at the lower border of the lung. A piece of rib was removed and a large drainage tube inserted. When the intercostal space was opened, he immediately coughed out a large quantity of pus and the air was also driven out forcibly through the wound.

The cough and expectoration, which had been almost incessant, now almost ceased, and he experienced great relief, but the cardiac area of dullness was increased, and it now became more evident that there was fluid in the pericardium. This increased rapidly; the pulse became very rapid and weak, and on February 24th it reached 140.

There was evidence of purulent absorption, and Mr. Campbell suggested that he should be given 10 grains of helmitol every four hours; this was continued for about a week and caused a fall in temperature from 103° to 99.5°. Previous to this pericardial trouble he was able to take from five to six pints of Jersey milk in the twenty-four hours; now he could only take a small quantity (about 2 oz.), as it brought on a feeling of distress and suffocation. His condition appeared to be all but hopeless, and he wished to be removed home. This was done on March 12th, and he arrived much exhausted. His heart gradually improved, and at the end of April the pulse had fallen to 98 and was fairly strong.

From April 29th till May 15th he expectorated a large quantity of fetid pus, and subsequently his temperature became normal and remained so. He went on improving steadily; the pulse had fallen to 84. The wound still discharged a little, and Dr. Calwell thought the fetid expectoration on April 29th might have been another pouch which had burst into a large bronchus. I thought it might have been from the pericardium, as the improvement in the pulse was remarkable from April 29th, when the fetid expectoration began, and the heart returned to its normal position and size. He was greatly emaciated, but began to take milk again in good quantities, and from this on improved steadily. After the operation he had a severe attack of neuritis in the right arm, which became more wasted than the left. I think I have never seen anybody so emaciated recover.

The chief points of interest in the case are the peculiar onset, the fact that although the abscess had discharged it continued to make its way to the chest wall, the purulent effusion into the pericardium, and the complication of neuritis. I was greatly perplexed by the course and prolonged duration of the disease; Broadbent said some of his cases took over a year, others six months.

Although the abscess was discharging the patient could not empty the sac completely enough to allow it to contract up so that a sinus formed to the ribs.

Mr. Campbell said that when he made the opening he felt that the pleura was adherent all round the opening,

and that the pleural cavity was cut off from any discharge into it.

The pericardial effusion and neuritis were probably the result of absorption and contamination of the blood.

A noteworthy feature was the entire absence of blood from the sputum. The fact of the abscess not forming in the lung substance but in the fissure would account for this.

A remarkable thing was the way the patient could empty the abscess once every day, and I was impressed with its importance. When we gave him an anaesthetic the emptying was brought about by lying on the side of the bed on his chest with his head dependent, when suddenly from 4 to 5 oz. of pus would be expelled through mouth and nose.

VERONAL POISONING: RECOVERY AFTER 100 GRAINS.

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THE publication in the JOURNAL of April 18th of cases of veronal poisoning has led me to believe that the following account of a case may be of interest.

A cook, aged 40, in a house near Dumfries, had been attending the dentist for severe toothache, and had announced her intention of "taking something to dull the pain." On the evening in question she was seen going to bed, unsteady in gait and muttering to herself, with a small bottle full of white tablets. It was supposed that she was under the influence of alcohol. She was afterwards seen in bed that night fully dressed. Next morning she was found snoring in bed, and could not be roused. On account of the wish of the servants to hide her supposed alcoholic condition, her mistress was not informed till after 10 a.m. On going up to see the patient, she found on the washstand an almost empty bottle of 5-grain veronal tablets.

I arrived at 11 a.m., and examined the patient. She was lying undressed in bed, deeply unconscious, and could not be roused by the most vigorous physical stimulation. The corneal and conjunctival reflexes were absent; the pupils, equal and medium, reacted to light. Plantar reflexes and knee-jerks were absent, and all the limbs were flaccid. The breathing was stertorous and slow (16); the pulse rather feeble but regular (66). There was no rise of temperature, and no evidence of incontinence of urine or faeces, or of vomiting.

On the washstand I found a tumbler containing a little water and a few grains of the veronal, which had evidently been crushed up with a hat-pin standing in the tumbler, and drunk in water. It was afterwards learnt from the chemist who had supplied the veronal that there had been twenty-five tablets in the bottle; four yet remained, and the fragments in the tumbler would not, I think, have amounted to 20 grains (though they were not weighed); so that the patient had taken a dose of over 100 grains, presumably after waking from her first sleep and undressing herself.

A hypodermic injection of $\frac{3}{16}$ grain of strychnine sulphate was immediately given, followed by one of $\frac{1}{16}$ grain of apomorphine hydrochloride, which, however, failed to produce emesis. I therefore passed the stomach tube and washed out the stomach with a weak solution of potassium permanganate; only a little mucus returned with the solution. Before the tube was withdrawn a breakfastcupful of strong coffee was introduced. The patient's condition, however, remained unchanged, and arrangements were made to admit her to the Dumfries and Galloway Royal Infirmary. The dose of strychnine was repeated one hour after the first. The patient was conveyed to hospital in a large motor car, then temporarily in use as an ambulance wagon, but an exceedingly rough journey of over four miles failed to arouse her in the slightest degree. After arrival at the hospital, about 1.30 p.m., vigorous flagellation with a wet towel produced slow movements and moans, but no other response. As her pulse by that time was of good condition, treatment in hospital practically consisted in allowing her to "sleep off" the effects of the dose.

That evening she became semiconscious; next day she was still very drowsy but partially conscious, and during the next three days gradually came round. At the end of a week she was discharged. There was not at any time any appearance of a pemphigoid or erythematous condition of the skin. She did not require catheterization.

I afterwards learned that she went home for a fortnight's holiday, and then returned to her situation.

The interesting features of this case are, I think, the ease with which the drug was procured, and the uneventful recovery after such a large dose.

I am indebted to Dr. Clarke, Senior Physician to the Dumfries and Galloway Royal Infirmary, under whose care the patient was, for permission to follow up her progress in hospital.