

Original Communications.

REPORT OF AN OBSTINATE CASE OF CHRONIC MYELITIS,

WITH ACCOMPANYING PARALYSIS OF THE LOWER HALF
OF THE BODY, SUCCESSFULLY TREATED.

By CHARLES TAYLOR, M.D. Edin., late Physician to the
Asylum, Walton, Liverpool; formerly President of
the Parisian Medical Society; etc.

[Read before the Nottingham Medico-Chirurgical Society,
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ROBERT MAKLEY, a plasterer, aged 35, came under my care in November 1860. At that time, he was suffering from equal paralysis of both lower extremities, with obstinate constipation, and incomplete control of the urinary bladder. He had been in this condition eleven months. He was a steady married man, with two children; and there was no evidence of hereditary taint, gout, syphilis, or lead-poisoning; but he had long suffered from various aches and pains, which he termed rheumatic. He was five feet seven inches in height, moderately strong, and of bilious temperament. The history of the case is briefly as follows. Without any very marked premonitory symptoms, he experienced one day, when at work in a windowless house, and while exposed to a strong draught, a peculiar tingling sensation in both legs, which soon amounted to numbness, and, in the night, to complete paralysis. He was then seen by a medical gentleman, who, after treating him for a fortnight, sent him into the General Hospital. While he was there, the limbs were rigid and motionless; the urine and fæces passed involuntarily; the formation of a bed-sore necessitated the use of a water-pillow; and he was discharged at the end of four months not improved. He was laid upon the sofa for some time after his discharge from the hospital, as he could not be got up stairs to bed. He was then taken to his native parish; and, after remaining a short time in the workhouse hospital there, was declared incurable, and placed upon the usual allowance given to permanent cases.

When I first saw him, some months after his return home, the power of locomotion was impaired to the following extent. During the day he was on a sofa down-stairs, and at night it required two persons to get him up a flight of ten steps; if it were necessary for him to go three yards from his own door, a neighbour habitually carried him. He could, however, if urged, manage on the level house-floor to move a few yards with the help of a pair of crutches; but, to do this, he was obliged to keep leaning against the wall with his eyes fixed on his feet. He complained more particularly of sensations of heat and cold, pins and needles, formication, etc., referred to the lower limbs; of a feeling as though a cord were tightly bound around his body; and of obstinate constipation. He did not know where his legs were as he lay in bed; he could not tell which was touched when one was pricked; they were cold, requiring extra clothing; and he was much annoyed by cramps in the calves, with frequent twitchings. When he attempted to move, he used extraordinary efforts; every muscle being, as it were, brought into action, motion was accomplished with a jerk, and the feet were deposited some distance from the spot where he wished to place them. Tickling the sole caused painful reflex action, which was otherwise easily excited, and at times, especially at night, would be so violent as to throw off the bed-clothes, and require considerable external force to overcome. Anæsthesia of both legs was marked, and it extended as high as the umbilicus,

on a level with the line where he complained of the feeling of tightness. He was quite unable to support himself, even with crutches, in the dark, and swayed over if he closed his eyes.

On examining the back by pressure and percussion marked tenderness was elicited on a level with the third dorsal vertebra. A spongelike of hot water passed down the spine gave a normal sensation of heat, until this spot was reached, when the feeling was that of burning; and a similar result followed the application of a sponge of very cold water. A primary interrupted current of electricity, from Legendre and Morins' machine, passed in the course of the affected muscles, showed that the electro-muscular contractility was slightly diminished. The vascular and respiratory organs were healthy, and the abdominal viscera sound. There was no headache nor vertigo, the intellect was clear, and he was free from cerebral disease. The tongue was moist, slightly furred, and steadily protruded in the median line; the appetite was indifferent; his gastric digestion was pretty good; pulse 80, and feeble. The skin was harsh and dry; the feet and ankles were œdematous: the urine was alkaline when passed.

He was ordered to sleep on a mattress; to avoid lying on his back; to clothe the arms and legs in flannel, and to let them be habitually placed lower than his body. His wife was directed to apply a cold douche, followed by violent rubbing with mustard, to the spine every morning; to beat the back twice daily alternately with the ends of a towel, one dipped in very hot, and the other in very cold water; and pills, each containing one quarter grain of belladonna and four grains of ergot of rye, were prescribed, one to be taken thrice daily. Under this treatment he speedily improved; all the symptoms were slightly ameliorated, and in six weeks he was able to move twenty yards from his door with crutches. The pills were continued with the best effects for the space of three months, when the feet became so icy cold that I was afraid of the supervention of dry gangrene, and omitted the ergot, continuing the belladonna, in conjunction with five grains of iodide of potassium, and a dessertspoonful of cod-liver oil, thrice daily. An occasional aperient was also from time to time administered. At this period he could walk on a level floor without any assistance or support; and continuing to improve, soon found himself able to walk couple of miles with the aid of a stout walking-stick.

In March, 1861, after four months treatment, he felt able to resume work, and obtained a light job in painting. His employer's place of business was situated a mile from his residence, and he used crutches to go to and fro. The exertion, however, proved too much for him, and he suffered from a relapse, which was apparently provoked by a chill, and which necessitated his withdrawal from work and a resumption of the medicine. Under this, the ergot being again administered, he once more steadily improved; and in June last, after six months treatment, he could walk easily, with the aid of a stick, from Basford to Nottingham (a distance of two miles) and back again. About this time he was enabled, through the kindness of benevolent lady, to visit Buxton for three weeks. His general health and strength were much improved by the change, so that in July—seven months from the commencement of the treatment—he was able to take situation as French polisher, walking from Basford to Nottingham to his work in the morning, and returning at night. At this period he was so well that I considered all medicine and treatment (during the course of which I must not omit to mention, he had, as general tonic occasionally, small doses of iron and quinine), might be safely discontinued. The event proved that I was correct in this opinion; as since then the improvement has been steadily maintained, and he can now, as you will see, take up one leg and hop on the other, and walk backward

and forwards with his eyes closed. He can walk ten miles in the day, or at the rate of four miles in the hour, without any support, and can dance a few steps of a horn-pipe; and on one occasion, during a press of business, he stood at his present employment from six in the morning to eleven at night, with only short intervals for meals.

In spite of all this improvement, such as indeed is seldom seen in persons who have once been the subject of myelitis, there is still to be noted a slight want of power in guiding the legs, and of coordination of muscles; which is, however, evidence less of the inefficiency of the remedies employed, than a proof of the gravity of the affection from which he suffered.

[The patient, who was then introduced to the notice of the members of the society, stated that he had walked two miles without a stick that evening, in order to be present at the meeting, having previously done a good day's work; and that he should return in the same way. He hopped on either leg, etc. He stated that he had recently done as hard a day's work at his old employment (wall-plastering), as he had ever done before his illness, etc. He walked erect, with full confidence, without looking at his feet; and a stranger would not have known that he had had anything the matter with him.]

REMARKS. The foregoing presents an interesting case of paraplegia, the result of chronic myelitis. The phenomena presented had existed, in spite of careful treatment by three or four practitioners, for eleven months before I saw the case; and he was at last regarded as incurable. The symptoms were clearly due to myelitis; and the upper limit of the inflammation was marked by the tenderness on pressure, and by the abnormal sensations occasioned by the application of cold and heat on a level with the third dorsal vertebra. That the inflammation was seated high up in the cord—at all events above the dorso-lumbar enlargement, was also demonstrated by the fact that the patient suffered from frequent fits of violent spasmodic movement in the lower limbs, which, sometimes recurring spontaneously, could always be excited by external irritation. This spasmodic affection of the paralysed members is, as Dr. Brown-Séquard has noted, the result of a morbid increase in the vital properties of the dorso-lumbar enlargement of the cord, owing partly to congestion of that part, and partly to an accumulation of power in consequence of its having ceased to be subject to the will. Had this portion of the cord been the seat of the inflammation, reflex movements would have been simply impossible; as clinical observation and pathological investigation have satisfactorily proved that, wherever this state of congestion passes on to true inflammation, the fits of spasms speedily cease, and it becomes impossible to excite reflex action. The spasmodic condition of the sphincters of the bladder and rectum (shown by the patient's inability to pass urine when he wished, and by obstinate constipation), also pointed to the fact that the disease was seated high up in the cord; as these muscles are almost uniformly completely paralysed when the dorso-lumbar enlargement is affected. The feeling as though a cord were tied round the body, complained of by my patient, is a very constant symptom in myelitis, and is usually felt at the limits of the inflammation; it is to some extent due to irritation of the sensitive nerve-fibres of the cord, producing a sensation referred to the periphery, and probably also in great measure to cramp of some portion of the muscles of the abdomen or chest. The sensations of heat and cold, pins and needles, formication, etc., which also constituted a marked symptom, originated in irritation of the grey matter, and were merely referred to the limbs in the same way that injury of the trunk of a nerve produces sensation at its distribution.

Alkalinity of the urine, a harsh, dry skin, diminished temperature, œdema, and tendency to the formation of

bed-sores, are all interesting effects of irritation of the nutritive or vaso-motor nerve-fibres; the first being a most important symptom, almost constant in myelitis, and serving to distinguish inflammation of the cord proper from inflammation of its membranes. The existence of anaesthesia was indicative of disease of the grey matter; and the effects of impaired muscular and tactile sensibility were well shown by the patient's inability to stand with his eyes closed, even with accustomed supports; and his utter loss of confidence in the dark. All these symptoms demonstrated that the grey portion of the cord was affected. Had it been one of those rare cases where the inflammation is limited to the white columns, the symptoms would have been much less decided; had the posterior columns been affected, there would have been marked hyperaesthesia; while, had the paralysis been due to disease of the anterior columns, there would have been no anaesthesia, scarcely any referred sensations, and either marked lesion or entire abolition of the electro-muscular contractility. The symptoms could not be due to inflammation of the membranes of the cord, as I was at first led to suppose by the rheumatic nature of the complications. The signs indicative of that special lesion were wanting; for instance, the pain was not so much increased by movements of the spine backwards, forwards, or laterally, as by pressure; there were no frequent or constant spasms of the muscles of the back, sometimes even tetanic in character, such as are seen in cases of meningitis; there was no severe pain in the nerves issuing below the seat of the affection; the referred sensations were well marked; and the urine was alkaline when passed. The case was not one of simple congestion, for, had such been the case, the symptoms would have been of a much less decided character; the patient would have been worse after a night's rest, and position would have had a more marked effect on the degree of paralysis, which would also have varied much. The gradually increasing severity and persistence of the symptoms distinguished the disease from hæmorrhage; and it presented no analogy to cases of paraplegia due to tumour or white softening, or such as occasionally arises from peripheric irritation.

Myelitis in the acute form is very generally fatal; and the chronic subacute cases have long been regarded as all but incurable. These latter, at first localised in some definite portion of the cord, when neglected or improperly treated, gradually extend, accompanied by more and more complete paralysis. The disease shows no tendency to spontaneous recovery; but it often does not destroy life until after many years of suffering. Cases are recorded where it has existed upwards of twenty years. When judiciously treated, it may sometimes be arrested in its progress, but it is seldom that we can obtain a complete cure; this is owing to the fact that the injuries inflicted by inflammation on the delicate structures of the cord are almost irreparable. In the patient I have just presented to your notice, although he can walk nearly as far and nearly as fast, and do almost as much work as before his illness, you may still note the embers of the extinguished fire in a certain want of that ability to direct movements which is possessed by all healthy persons even of much less muscular power.

As to the treatment; the symptoms of irritation and increased vital properties of the cord indicated the necessity for the adoption of such means as would have the effect of diminishing the amount of blood in that important nervous centre; and, happily, of late years, owing to the distinguished labours of Dr. Brown-Séquard, we are able to do so very effectually. In addition to position, spinal derivatives and counterirritants, we have in belladonna and ergot of rye, two excitants, which acting on the unstriped muscular fibres produce powerful contractions in the blood vessels of the spinal

marrow. Dr. Brown-Séguard says, "Not only have I seen the diminution in the calibre of the blood-vessels of the pia mater of the spinal cord taking place in dogs after they had taken large doses of belladonna or ergot of rye, but I have also ascertained that the reflex power of the spinal cord (as a consequence of such contraction), becomes very much diminished under the influence of these two remedies, which, in so doing, act just in the opposite way to strychnine." Bretonneau, Barbier, Trouseau, and other foreign physicians, have for years empirically employed these two remedies in the treatment of paraplegia, sometimes with good, sometimes with ill effect; but it was not until Dr. Brown-Séguard pointed out in what cases they ought to be administered and in what avoided, that the treatment of paraplegia was placed on a rational basis. Thus, it has been clearly ascertained that belladonna and ergot of rye possess the power of diminishing the amount of blood in the spinal cord, the same power being possessed in a less degree by iodide of potassium, mercury, hyoscyamus, stramonium, and Indian hemp. These, therefore, are the remedies which should be administered in all cases where symptoms of irritation of the motor, nutritive, or sensitive nerve-fibres of the cord, together with increased vital properties, indicate a hyperæmic condition of that important nervous centre; while strychnine, which has an opposite effect—a property shared, though to a much less degree, by opium, and perhaps also to some slight extent by phosphorus, cantharides, and sulphur—should be religiously avoided. To quote again from Dr. Brown-Séguard: "Strychnine ought to be avoided as a most dangerous poison in those cases of paraplegia in which there are signs of congestion or inflammation of the spinal cord or its meninges—in those cases strychnine can only increase the cause of the paralysis.* The contractile power possessed by belladonna and ergot of rye—but in a major degree by the ergot—is, in the course of treatment, often carried so far as to affect the capillaries of the extremities, so occasioning icy coldness of the feet. This is an indication for withholding the latter remedy, which, if continued too long, would occasion raphania and dry gangrene, such as is observed in countries where ergotised wheat has been used as food. It may, however, in general be safely given for a space of four months, and resumed after an interval of six weeks. Belladonna may be given almost any length of time; a quarter of a grain thrice daily did not in the preceding case affect vision, and it is not usually necessary to give such a dose as will do so. Dryness of the throat, occasioning difficulty of swallowing, is however often complained of, and may necessitate its intermission for a time. The other remedies were merely administered as general tonics, and I do not doubt that if the patient's condition had been such as to admit of his living well under more favourable hygienic conditions, and with a more strict observance of adjuvant measures, that his recovery would have been more rapid.

In conclusion, permit me to call attention to the value of electricity as a means of diagnosis in cases similar to the one I have just recorded, and as a means of treatment in many presenting like external characters. It will have been observed that I called especial attention to the fact that but slight impairment of the electro-muscular contractility was noted on the passage of a direct interrupted current in the course of the *vis nervosa* of the affected muscles; I also observed that this was an additional reason why we should conclude that the anterior columns of the medulla spinalis were but slightly affected in the case before me, and also a reason why we should refer the principal seat of the

disease to the grey matter of the cord. Indeed, had the chronic inflammation which existed terminated in lesion of the anterior columns, such lesion would have been infallibly indicated by either (according to the extent of injury) marked diminution or complete abolition of the electro-muscular contractility; a symptom which, while it is marked in all cases of actual disease or injury of the anterior columns of the cord or of the individual mixed nerves issuing therefrom, exists only in one other form of paralysis, namely, that which is the result of saturnine impregnation (which latter may always be distinguished by the elective affinity of the poison of lead for certain muscles). This observation is well illustrated by cases of paraplegia, the result of injury to the spinal cord, either from fracture or violent concussion, where (unless the injury have been repaired by time, when we may hope to restore the patient by Faradisation) the electro-muscular contractility is completely abolished; as it is also in cases of paralysis from division or injury of compound nerves, as is seen in loss of power of certain muscles of the arm from injury of the nerves of the brachial plexus, an occasional consequence of dislocation of the humerus, in paralysis of the deltoid from injury to the circumflex nerve, and in paralysis and atrophy of muscles, such as we have recently had an example of in this town, from division of the nerves supplying them by a cutting instrument.* Other forms of paraplegia or paralysis may be at once diagnosed and distinguished from the preceding, by the electric irritability maintaining its normal standard; for example, there are certain cases of progressive general paralysis due to a spinal cause, which may not by any other means in an early stage be known from the progressive general paralysis of the insane. These are readily distinguished the one from the other by the condition of the electro-muscular contractility; this function being impaired or abolished in the former class of cases, while in the latter, which own a cerebral origin, it is rather increased than diminished—a fact first shadowed forth by the researches of our illustrious townsman, Dr. M. Hall (*On the Condition of Muscular Irritability in Paralyzed Limbs*), though unfortunately, from imperfect localisation of the stimulant by him, left to be completed by the distinguished author of *Electrisation Localisée*. Again, in the fatty atrophy of muscles—miscalled wasting palsy, which is in reality no paralysis at all, but simply a degeneration of muscular fibre arising from various causes which I shall not consider at present, but certainly from no nervous lesion—we find that the contractility of the muscles under the stimulus of electricity is absolutely perfect so long as a fibre remains free from fatty transformation. The same rule also obtains in cases of paralysis of a rheumatic origin; and in cases of hysteric paralysis, in which we have, in addition, diminution of the electric sensibility; and, lastly, we have in the application of the electric current a valuable means of distinguishing cases of reflex or peripheric paraplegia from cases dependent on spinal lesion, as the electric irritability is, as a rule, intact in cases of reflex origin, and diminished or abolished according to the affection of the anterior columns of the cord in cases of myelitis. As a mode of treatment, careful localisation of the primary or secondary Faradic current, or of both, in the affected muscles by means of wet sponges, on the cutaneous surface by means of the electric brush; the *clou électrique*, fustigation, or electric moxa, is often of magical efficacy in cases of rheumatic, hysteric, and sometimes of peripheric paraplegia; while persevering application has a most decided influence in restoring rebellious cases due to lead-poisoning, and those arising from accident or injury to the cord, or division or injury

* As strikingly illustrative of the truth of the preceding remark, see Five Cases of Paraplegia, recorded by Dr. Nash of the Madras Army, in the *Lancet* for February, 1862.

* "La simple contusion d'un nerf peut occasionner une diminution considérable de la contractilité et de la sensibilité électriques dans les muscles qu'il anime." (Duchenne.)

of the nerves arising therefrom. Lastly, Faradisation is useless in the general paralysis of the insane; injurious in myelitis until after recovery has taken place; and is the only remedy worthy of confidence in the fatty atrophy of muscles, and in the *paralysée atrophique graisseuse de l'enfance*. As strikingly illustrative of the charming results sometimes obtained by its judicious employment, I will, in conclusion, quote the following case which I treated when in practice in Liverpool, and which was subsequently published in Mr. Lobb's work on galvanism.

CASE. A. B., aged 18, a single gentleman, came under my care to be treated for an attack of paraplegia, on August 27th, 1859. He was a fresh looking well developed young man of sanguine temperament. The vascular and respiratory organs appeared healthy, and the functions of the abdominal viscera were well performed. The pulse was 80, regular; the skin was cool; the tongue was furred, moist, and steadily protruded; there was no defect of articulation. For some time past, he had been complaining of gradually increasing debility of the lower limbs; and latterly they had been utterly useless as organs of locomotion. He was quite unable to stand, and moved from one apartment to another by the aid of a pair of crutches. If he attempted to rise from a sitting posture by grasping a chair or table, he fell back quite helpless; if supported on one side, the legs doubled up, the knees knocking together; and, if not prevented, he would sink to the ground. He had no pain in the back, and no pain was felt on percussion along the spine. Sleep was natural, not troubled with dreams or involuntary startings; the senses and sensibility were normal. There was no evidence of saturnine poisoning, of worms, nor of rheumatic affection. The functions of the bladder and rectum were normal; and the superior extremities were unaffected. He had been taking eleven grains of sulphate of zinc daily, which was prescribed by the late Dr. Bright. Two sisters were afflicted much in the same way to a greater degree; one having been confined almost constantly in the recumbent posture for eleven years.

August 27th, 1859. A gentle to-and-fro galvanic current was passed from the lumbar region to the feet, and electricity localised in each of the affected muscles for one or two minutes.

August 30th. He complained of lassitude after the last *séance*; but expressed himself now as slightly improved. The localised electricity was again applied.

September 1st. He was able to put down his crutches and walk across the room to meet me to-day. He stated that since the last operation he had put his foot in the stirrup and mounted a horse unassisted. The electricity was repeated.

Sept. 3rd. Owing to indisposition, I was unable to attend to-day, according to appointment; but received a note from the patient's mother, stating that the crutches were quite discarded, and that he was so well as scarcely to need further help.

Sept. 4th. The patient attended church to-day, walking there and back, about a quarter of a mile, and standing during service.

Sept. 5th. He could walk steadily at a good pace. He expressed himself as quite recovered. The electricity was repeated.

Sept. 7th. He stated he could run and jump as well as any body; he appeared quite well. The electricity was repeated.

The following remarks were appended to this case. "The effect of the galvanic current in the foregoing case was marvellous; and to witness the delight with which the patient noticed the rapid and decided improvement, was truly gratifying. Completely crippled himself, and with the melancholy spectacle before his eyes of two paralysed sisters, whose cases had resisted all treatment, no wonder that it was with but little faith

that he resorted to galvanism as a *dernier espoir*. So slight was his hope of benefit, that had not the improvement been as rapid as it was marked, I feel that he could not have been induced to continue the application. The integrity of the electro-muscular contractility, and the absence of any decided indications of head-affection, excluding the diagnosis of cerebral or spinal lesion, warranted a very sanguine prognosis, and thus enabled me to offer him sufficient inducement to commence the treatment.

"The current passed from the lumbar region to the feet was merely a *placebo*; and I attributed the cure entirely to the localisation of the electricity in each of the affected muscles."

I met the patient some two years afterwards at the seaside quite well, and believe he has since continued in perfect health.

ON MALGAIGNE'S HOOKS FOR FRACTURED PATELLA.

By CAMPBELL DE MORGAN, F.R.S., Surgeon to the Middlesex Hospital.

In a recent number of one of the medical journals, M. Malgaigne's hooks for the treatment of fractured patella are classed amongst the fracture apparatus which "may be regarded as models of what ought not to be used."

At the Middlesex Hospital, a large number of cases have been treated by the application of these hooks—perhaps, in no English hospital have they been more frequently used—and the results have been very satisfactory. My colleague, Mr. Henry, called attention to some cases under his care, in which a very close, and probably a bony, union had taken place under treatment by this apparatus.

The instrument consists of a pair of iron plates, each furnished at one end with two double sharp pointed hooks. One pair of these hooks is thrust through the skin, and is made to catch upon the upper edge of the bone; the other is similarly thrust in till it catches the lower edge. A screw bar then unites the two pieces; and by turning this the separated portions of bone can be readily brought into contact. When once fixed the hooks are allowed to remain until the parts have united; or until it may be thought desirable to replace them by a starched bandage.

Now, this sounds like a painful and somewhat savage proceeding, and one likely to be attended with danger; whether, in ordinary cases of fractured patella, and when cautiously applied, the hooks can give rise to mischievous consequences, I do not know. I have never seen the least indication of such results; and should not anticipate their occurrence. But as to the extremely small amount of pain which their application produces, and to its almost entire, and often entire, absence during the time they are worn, I can speak very positively; so far as the cases which I have seen or treated are concerned.

A case occurred not long since in the hospital, which illustrates this very satisfactorily. A woman slipped in coming down stairs, and fractured both patellæ. There was for three days a good deal of effusion into the joints. When this had subsided, I applied the hooks to the one side, leaving the other without any apparatus at all; both legs were raised in the usual position. Pain was, of course, produced, but only to a slight extent, while the hooks were being thrust through the skin. When I saw her the next day, she had not more pain on the one side than on the other; in fact, she had no pain on either side. The hooks remained on for more than a month without producing the least irritation or uneasiness. The broken portions of bone were pretty closely approximated on the side to which the hooks had been