Lectures.

INSULAR SCLEROSIS OF THE POSTERIOR COLUMNS OF THE SPINAL CORD.

A CLINICAL LECTURE DELIVERED AT THE HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA.¹

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GENTLEMEN, — This patient has been sent to me by a friend in the city, who states that he thinks that this man has sclerosis of the posterior columns of the spinal cord or progressive locomotor ataxia. He gives the following history: He is forty years old, a farmer, married; has been married for seven years. Has one child, who is three years old and healthy. The symptoms of the present disease manifested themselves in February, 1881. While loading hay he slipped, but apparently did not hurt himself much. The following day the legs began to get stiff and numb. He, however, continued to work until August, 1882. The limbs were not as strong as before, but he was still able to do his work, and walk twenty miles in hauling hay to the city. In May of 1882 one eye began to fail, and seven months ago the second eye began to be affected. He thinks that if he could see he would be able to work as well as before. About the time that the numbness first appeared he had occasional pains in the limbs, but during the past year they have, at times, been unbearable. They shoot through the thighs like lightning, darting from one joint to another, and from one leg to the other. These pains are worse at night. About a year ago he had severe shooting pains across the forehead. He has had no pains in the arms. The parts where the pain appeared never became red and swollen. There have then been fulgurant pains through the limbs, presenting the characteristics of those met with in ataxia. With this perverted sensation there have been some numbness and tingling, some impairment of feeling, and some loss of power, with amaurosis coming on within the last year, the amaurosis being preceded by fulgurant pains in the neighborhood of the eyes.

Let us now study further in regard to the development of the symptoms. There has been no jerking of the legs. He has not lost much flesh, but the limbs are somewhat wasted. Appetite and digestion are good. He states that once in a while he has bilious spells, but does not vomit at such time unless he has sick headache. He is very subject to sick headache, having, on an average, an attack about once a month. The bowels are regular, and there is no trouble with the bladder. There is a total absence of bladder and rectal complication. The time at which these organs become involved varies, but, as a rule, they are affected sooner or later.

There has been present in this case that which is frequently met with in ataxia, namely, gastric crises, attacks apparently not dependent upon indiscretion in diet, taking cold, or other obvious cause, in which there is neuralgic pain associated with loss of appetite, nausea, and very often vomiting. Not rarely ataxic cases will be found to present attacks of this kind. In some cases they are extremely well pronounced, while in other cases the disease runs its entire course with-

out the appearance of such attacks. I do not know that I am right in saying so, but I think that my experience will bear me out when I state that these crises are more marked where amaurosis is present and distinct. Where sclerosis of the higher centres governing the eyes makes its appearance disturbance of the pneumogastric tract is more common than when the sclerosis is limited to the posterior columns of the cord.

So much, then, for the history, which points to progressive locomotor ataxia. Let us now see if the present condition bears out this suggestion, first directing our attention to the eyes, then to the power of locomotion, and finally to the condition of the muscles of the affected part.

The right eye was the one first affected, but both are now in about the same condition. He can distinguish light from darkness, and that is about the extent of his vision. This man unquestionably has degeneration of the optic nerve and retina, but the eyes will be subjected to a careful ophthalmoscopic examination. These degenerative changes are found in locomotor ataxia when the sclerosis involves the higher centres.

He states that he has no difficulty in walking except that which is due to his inability to see where he is going. Before the eyes were so much involved he was able to walk twenty miles a day with a load of hay in all kinds of weather. The legs, he thinks, do not feel so stiff as they used to. As he walks across the floor he certainly walks very well, but, as you see, there is a certain amount of incoördination of the muscles; but when the length of time which the disease has lasted and the condition of the eyes are considered the amount of incoördination is extremely small. He is not at all giddy.

Examining the patella reflex I find that there is no response whatever in either limb. The condition of the reflex patella and ankle furnish interesting and important signs which you should always study in cases of suspected organic change of the spinal cord. As you are aware, irritation of certain areas of the skin produce certain reflex movements of the muscles of other parts of the body, so that by a study of these reflex movements the location of the disease of the cord can often be determined. Thus irritation of the skin of the inside of the thigh produces a cremaster reflex, while irritation of a patch of skin a little higher produces a reflex movement in the muscles of the abdomen. These symptoms are always worthy of study. I have been a little disappointed in the use of these signs, because I have found cases of functional disease of the cerebro-spinal axis where the patella reflex was totally lost, and yet where the course of the case proved conclusively that the affection had been one merely of anæmic exhaustion without any organic disease whatever. I find that others have observed the same thing. The law laid down as to the absolute pathognomonic value of the absence of patella reflex as a sign of advanced posterior sclerosis must be regarded as subject to exceptions. At the same time it is a symptom that possesses a certain value, and when we find, in connection with fulgurant pains and incoördination of the legs, a total loss of patella reflex we know that in all probability there are changes in the posterior columns of the cord.

In this patient the legs feel numb, but sensation is not entirely lost. This is commonly the case. A critical study of the condition of sensation, for which we

¹ Reported by William H. Morrison, M. D.

have not time to-day, might reveal that in some areas there was actual loss of sensation, while in others the anæsthesia was not absolute.

This is not an ordinary case of sclerosis. It is an example of what is called insular sclerosis. This is a rare disease. The posterior columns are affected, but not in the way that they are in ordinary locomotor ataxia. As you probably know, the earliest symptoms of this latter disease are perverted sensation, fulgurant pains, increasing incoördination of the muscles of the leg, and slight wasting, but no actual paralysis. These are the symptoms of the early stage. The disease advances up the posterior columns, following the physiological course of the fibres. As the disease involves a higher portion of the cord the movements of the arm become affected. When the disease has reached the lower cervical region the eyes become involved, and amaurosis is apt to be developed. Later the sclerosis may affect the crura of the brain, and may extend into the expansion of these columns.

In the present instance the disease has pursued a less regular course. There have been unmistakable symptoms of sclerosis, beginning in the lower portion of the cord. There has been perverted sensation, incoördination of the muscles, fulgurant pains, and loss of patella reflex; but these symptoms have not been present to such a degree as to indicate that the entire posterior column had passed a state of degeneration. If this spinal cord could be examined I have no doubt that small islands of gray degeneration would be found scattered through the posterior columns, and, corresponding with the development of the marked ocular symptoms and the severe cerebral attacks, that insular sclerosis had developed high up, possibly involving the crura, pons, or higher centres. These cases of insular sclerosis are less common and less regular in the development of the symptoms than are cases of ordinary sclerosis of the posterior columns, but they are usually recognizable with a little care.

We shall next consider the ætiology, prognosis, and treatment of this case. Of late years there has been an attempt made to establish an absolute connection between sclerosis of the posterior columns and syphilis. Erb and Rosenthal probably represent the advanced advocates of this view. The French, American, and English schools take a more moderate and fairer view of the matter. I have met with a number of cases where the most careful investigation of the individual life and of the family history has failed to reveal any evidence of syphilitic taint. In the present instance the patient positively denies ever having had any venereal disease of any kind. His father died at the age of ninety. His mother is still living at the age of ninety. His parents had ten children, of whom seven are living, and all are healthy except himself. One brother died suddenly of what was supposed to be heart disease, but he does not know what the others died of. The assumption that every case of posterior sclerosis depends on a syphilitic taint is unfounded. The question should, however, always be investigated most critically, because it has an important bearing upon prognosis and treatment. Other causes of this affection are venereal excesses, overexertion, exposure, and the like. In some cases it is impossible to discover any cause. This patient has led a life of hard work and exposure. This may have had something to do with the development of the disease. While it is true

that there are a large number of men engaged in farming, and locomotor ataxia is rare among them, yet there are tendencies in certain individuals to certain forms of disease developed by this exposure. He states that he has not indulged in sexual excesses, and that he has not lost sexual desire or power. This retention of sexual powers indicates, as does the retention of control over the bladder and rectum, that the deeper portions of the cord have not become affected, and makes the prognosis more favorable. Unfortunately the disease has involved the centres governing the eyes, and I fear that we shall find that there is no chance of restoring the lost vision. If this is the case the fact that we can arrest the progress of the disease and improve the condition of the limbs affords but little satisfaction.

The prognosis as regards duration of life is, I think, favorable. As far as regards arresting and improving the condition of the limbs it is favorable, but as far as vision is concerned it is unfavorable; but in order to decide this point a careful examination of the eye-ground is necessary.

These are cases for which a great deal can be done in the way of treatment. It is, of course, of the first importance to decide whether the disease is functional or organic, whether the symptoms are due to alteration of the circulation or to actual tissue degeneration. Cases are occasionally seen which present marked symptoms of locomotor ataxia and yet recover absolutely. For instance, not long ago I saw a case like this. A man working hard, with heavy financial responsibilities resting on him, gets into the habit of eating rapidly and irregularly, and takes to using tobacco to great excess, partly for the purpose of taking the place of food which he has not time to eat, and partly to divert the mind. He soon finds that his sleep is disturbed, and that he wakes early in the morning; sick headaches appear, with vomiting spells. Then he finds that he cannot walk at night as well as usual, that his legs get tangled up under him. His gait becomes worse, and people notice it on the street, and think that he is intoxicated. There is a little peculiarity in his appearance, but vision is not particularly affected. The patella reflex is entirely lost, and the man has a high degree of locomotor ataxia. He cannot walk with his eyes shut, and walks with his eyes upon his legs. The cutting off of the tobacco, stopping work, with complete rest, and a prolonged course of careful diet, restores him to absolute health. The ataxia disappears, he gains flesh and strength, returns to his work, and there are no further symptoms of the disease. I have seen such cases repeatedly. When in a case of this kind no cause such as syphilis, excessive venery, the immoderate use of tobacco, or overwork can be found there is more reason to suspect organic change than when some such cause exists.

When a definite cause is found the first thing to be done is, of course, to remove the cause.

If there is no such special cause as has been mentioned it will be found that in the early stages of the disease absolute rest exercises an extraordinary influence over the course of posterior sclerosis. Where a patient presents fulgurant pains, impaired patella reflex, ataxia, and gastric crises you will do well to order such a patient to bed and keep him there for a long time, unless you find that he does sufficiently well with a small amount of carefully-regulated exercise. I have seen cases where there was a distinct development of

the symptoms where I could find no cause which could be regarded as having produced the disease, and where I had no doubt that there was incipient change in the posterior columns, get entirely well by absolute confinement to bed, with carefully-regulated diet, and attention to the state of the muscles. It is the rest which does the good. By this protracted rest symptoms will be relieved which can be affected by no remedies.

I saw the other day an interesting case. A man consulted me for a condition of this kind. I gave him an unfavorable diagnosis and prognosis. He then went to New York, and consulted a prominent physician of that city, who gave him the same opinion that I had done. While walking along the street he slipped, and fell and broke his thigh. This confined him to bed for nine months. When he got well of the fracture he was well of the ataxia. He got out of bed practically a well man. The ataxia and pains had disappeared, and for a considerable time there has been no return of the symptoms. I would warn you against hastily giving an unfavorable prognosis. The removal of the cause and the securing of absolute or at least considerable protracted rest should rank as the first elements of the treatment.

A course of tonic treatment is, I think, always essential. Such patients are nearly always anæmic and below par. They usually do well under large doses of iron when given in some digestible form. The iodide of iron is a valuable preparation in this disease. It is useful in those cases where there is a catarrhal condition and a tendency to pulmonary troubles. The vegetable salts of iron, or dialyzed iron, may also be given. Iron should be used in large doses and long continued. In cases where there is a syphilitic history I need not say that antisyphilitic remedies should be administered. The best form is iodide of potassium in ascending doses until a large amount is taken. You will, however, be disappointed in many of these cases, even though they are originally of a syphilitic character, for the sclerosis, when once established, often resists specific treatment, and although you may arrest the progress of the disease and relieve some of the more troublesome symptoms, especially the pain, the degenerated fibres remain degenerated, and the damage that the disease has done will not be removed. It is not like those cases in which a gumma presses upon the cord. If the gumma is removed the pressure will be relieved, and the function of the cord restored. In such a case a perfect cure may be obtained.

In cases where there is no syphilitic history, and yet where, despite the removal of all ascertainable causes, the use of rest, tonics, iron, and cod-liver oil, the disease continues to progress and the irritative symptoms remain, you will find that prolonged courses of nitrate of silver will occasionally exert a beneficial influence. I shall not consider the manner in which this does good. Only under the circumstances which I have mentioned would I recommend the use of this remedy. Nitrate or oxide of silver given in large doses for a considerable period exerts a beneficial influence upon the progress of the disease.

A large number of drugs have been recommended for the treatment of this affection, but I should dread the effect of many of them upon the general health. A vast deal of harm is done by overdrugging. The same is true of the use of electricity. This remedy is usually indicated. If the patient is put to bed it is in-

dicated to supply the necessary exercise. But if the patient is allowed to move about it is not usually demanded. The slowly-interrupted galvanic current is the one to be employed. If the pains are severe this will often relieve them.

This man's condition is one in which it is difficult to give advice. So far as the lower part of the body is concerned we should have no difficulty, but in the presence of this blindness, which I fear is due to organic change in the optic nerve and retina, we shall have to treat him without reference to the head symptoms, and endeavor to restore the power to the legs and arrest the change in the columns of the cord, with the idea that he will learn some new trade which a blind man can practice. The prognosis and treatment must be governed by the condition of the legs.

I should advise this man to go to bed, have the muscles kneaded every day, and take but little exercise. The diet should be carefully regulated. With this I should give remedies to restore the exhausted nervous force, and large doses of iron continued for a long time. I should use no iodide of potassium or other alterative.

Original Articles.

ON MILK SUPPLY IN LARGE CITIES.¹

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PROBABLY few persons whose attention has not been especially called to this subject have any idea of its importance in an economic as well as sanitary point of view: and it may therefore be well to preface what I have to present to you to-night with a statement, unfortunately only approximate, as full and reliable figures are hard to obtain, of the amount of milk—or what purports to be such—required daily in our large cities.

Dr. H. A. Pooler, of Goshen, N. Y., estimates the amount sold daily in the cities of New York, Brooklyn, and Jersey City, at 500,000 quarts or 182,500,000 quarts annually. I have elsewhere shown from the statistics furnished by the Railroad Companies and the Board of Revision of Taxes, that the amount in Philadelphia alone is 57,548,470 quarts. The supply of Boston I have sought for but have not received a reply from the Secretary of the State Board of Health. But if we compare these figures with the population of the four cities named we find in round numbers as follows:—

182,500,000	quarts consumed among	2,500,000	persons.
57,500,000	"	"	900,000 "
240,000,000	"	"	3,400,000 "

or about 70.6 quarts annually, or not quite $\frac{2}{3}$ of a pint daily for each man, woman, and child. This is rather more than the average of England, less than half that of Wales, not one third that of Scotland or Ireland, and far below that of Norway, Sweden, Switzerland, and the Tyrol, as we learn from Edward Smith "On Foods," and Brassey "On Food and Labor." We may therefore fairly conclude that this is not an over-estimate of the actual supply in these cities. If we

¹ Read before the Section for Clinical Medicine, Pathology, and Hygiene, of the Suffolk District Medical Society, February 27, 1884.