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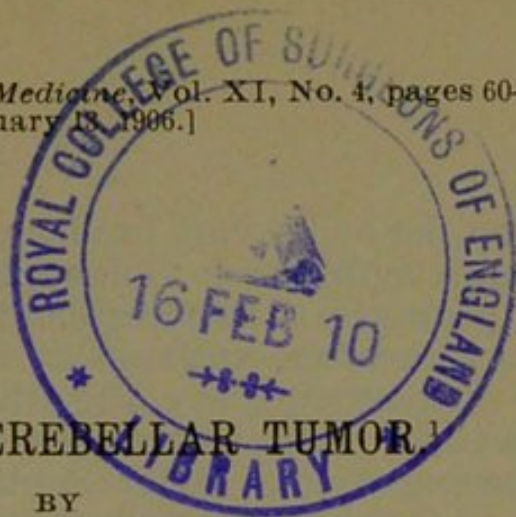
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A CASE OF CEREBELLAR TUMOR.¹

BY

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Before presenting this communication upon a rather unusual case of cerebellar tumor, I wish to state that the man in question was sent to me for ocular treatment by Dr. A. T. McMullin, of Kensington; and I wish also to thank Dr. William Turner VanPelt for his care of the patient at the Episcopal Hospital during the last stages of his illness, and for his extreme courtesy in giving me the later history, which thus enables me to present the case in full.

The patient, a young man of 26, the fourth of eight children, had come from England in boyhood. He was a printer of cotton stuffs. He had passed through infancy and adolescence without serious illness. At about 15 he had an attack of insolation, from which he promptly recovered without sequels. His father died of heat stroke four years ago; recently a paternal uncle died of apoplexy. There is no history of tuberculosis or of cancer in the family.

At Easter, 1904, the young man was suddenly seized with a violent attack of headache, which lasted four days. There were no unusual symptoms associated; it caused no alarm, and good health was regained. In July he was married and sailed for England. In mid-ocean he felt very heavy-headed, so he remained in his berth until noon each day for the rest of the voyage. Once he was seized with violent vomiting. These symptoms were thought by the ship's surgeon to be only those of seasickness. After landing, and on arrival in

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London, he had severe headaches, and, without previous dyspeptic symptoms, violent attacks of vomiting, which were projectile in character. Then for a considerable period thereafter, until about September, he had headaches on alternate days, the attacks usually taking place on awaking in the morning. He was not affected by sightseeing tours. After September, until sailing for home in October, there were infrequent attacks. On the voyage he was very sick, having but two well days; on three of the days there were violent spells of vomiting. On landing, October 20, he vomited from 2 o'clock a.m. until 8 o'clock a.m.

It was at this time that his physician, Dr. McMullin, was sent for. The young man was suffering intensely from pains in the head, in the occipital and frontal regions. These pains were usually most violent early in the day, subsiding at evening. All of the bodily functions at this time were apparently normal, but later, about the middle of November, the right side of the face became crooked, which continued for about a week. The tongue was not affected. Now, for the first time, it was noticed that the external rectus muscle of the left eye was paralyzed, and a day or so later diplopia, which was said to have been alternating in character, set in. This was followed by dimness of vision, and photophobia. Except on the days of the headaches, when the arms and legs felt numb, he was able to exercise and to take long walks without fatigue. The headaches had gradually subsided, and a loss in bodily weight was rapidly regained. At no time had his friends noticed alteration in his gait or carriage. He felt well and reasonably happy. At times, when he had his headaches, he became irritable when the younger members of his household were noisy. This is not to be wondered at, when we consider the fact that all of the family were members of an amateur orchestra. He had led a most pure life, and by his statement, he was free from venereal disease, yet he was greatly annoyed by a painful priapism, which impelled him into inordinate sexual indulgence without gratification.

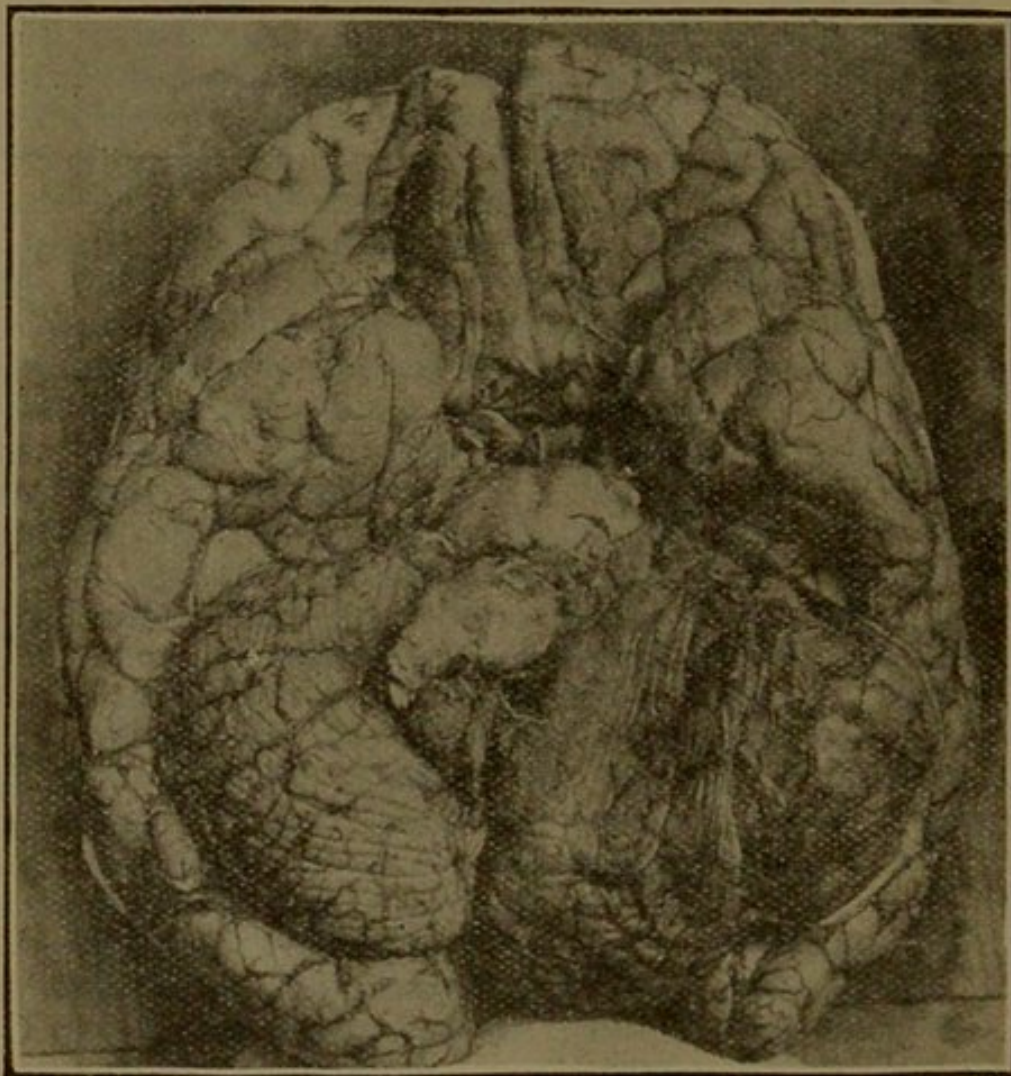
The man was sent to me on December 22, 1904. He was five feet seven inches in height, robust, weighing about 145 pounds, having a good, ruddy complexion. There was nothing remarkable in his gait or station. His movements about the darkened room were in the manner of one whose visual fields had been contracted.

His expression was vacant, like the state of one having optic neuritis. The tendon reflexes were apparently undisturbed; neither were disturbances of general sensation complained of; while objects and familiar utensils were handled with accustomed facility. His replies to my inquiries were clearly and concisely given, his memory being perfect and retentive.

The chief complaints at this time were referred to the ocular apparatus. The visual acuity of the right eye was reduced to $6/15$, of the left to $6/22.5$; the accommodation power was abolished, so that Snellen's reading types could not be read. The optic axes markedly converged; the left external rectus muscle failed to effect parallelism. There was no nystagmus. Homonymous diplopia was complained of, but it was not possible to measure it satisfactorily. Except in outward rotation, the muscular movements of the left eye were unlimited. The pupils measured 4 mm. each, and were fixed, failing to respond to the usual stimuli; but when, however, the eyelids were forcibly closed, and after pressure on the frontales muscles, the eyes suddenly exposed to strong light, the pupils dilated widely. This paradoxical pupillary phenomenon was constantly obtained after repeated experiments. When the facial muscles were at rest the normal relations of the two sides of the face were disturbed (the left side was slightly drawn over to the right); when efforts were concentrated, the relationship between the two sides became readjusted. The protruded tongue could be directed forward, though it was very tremulous. The visual fields were concentrically contracted; colors were not perceived and the blind spots were greatly enlarged. There was no history of polyuria; neither was albumin nor sugar detected.

Ophthalmoscopic Examination.—The right pupil was not perfectly round, nor was there a reflex during the examination with the mirror. Fine granular deposits, resembling those of ciliary exudation, were noticed on the anterior capsule. There were no signs of antecedent iritis. Projecting into the clear vitreous was a greatly swollen optic nerve head, the summit of which was measured by a plus 5 D lens. The retina was everywhere edematous, the macular and foveal region remaining like a deep pit surrounded by the raised retinal sheet. No areas of exudation were discovered. The arteries were constricted and reduced to threads, while the veins were great, broad, tortuous currents. On the

swollen nerve head were several flame-shaped hemorrhagic extravasations. The fundus conditions of the left eye were quite similar to those noted in the right, though they were more extensive and pronounced. The hemorrhagic extravasations on the disc, as well as those in the fiber layer of the retina, were larger and more numerous. These extravasations were like those seen in marked cases of hemorrhagic retinitis and other



ocular diseases, and have frequently been noted in cases of cerebellar tumor. The intraocular symptom-complex differed, however, from that observed in the course of systemic disease. In the walls of the bloodvessels no signs of degeneration were apparent; the entrance and exit of the currents were mechanically interfered with by the choked disc.

In reviewing the history of the case, the points to be

observed are: 1. Head pains localized at the occiput, though at times radiating to the vertex. 2. Vomiting, without nausea, nor dependent upon the ingestion of food; indeed, it invariably occurred in the morning. 3. The early development of an intense optic neuritis, the effects of which were relatively equal in the two eyes. With these symptoms, so marked from the beginning, I was safe in assuming the case to be one of brain tumor. Of some special or localizing symptom, however, I was in doubt. There was the facial palsy, yet this had not remained constant in extent and duration. The pupillary reaction was paradoxical. 4. There remained to be considered only the abducens palsy. I could not help regarding this as of importance in connection with the other factors, and particularly the optic neuritis, in spite of the uncertainty of the causation of this symptom. There is no cranial nerve so liable to provide a distant symptom as the sixth. The lengthened course which this nerve takes over the most prominent part of the pons renders it readily affected by distant pressure. (Gowers, quoted by Swanzy.) I was fascinated by the presence of this symptom, and I boldly ventured the diagnosis of cerebellar tumor.

On December 27, the patient was admitted to the Germantown Hospital. Here he was confined to bed and a course of treatment was instituted, consisting of alteratives, diaphoretics, and salines. At the end of ten days the convergence and the diplopia had disappeared. The edema of the retina and venous engorgement became remarkably reduced, and no new hemorrhages were noted. The patient was then allowed to be out of bed, and was given the freedom of the ward. At no time was there vomiting or headaches, neither was there disturbance of locomotion nor change in station—of this there can be no doubt. The visual acuity of each eye remained unchanged. The optic papillas remained as prominent as at the earlier examinations. During the patient's stay in the hospital I was not a little surprised at the speedy regression of the symptoms. It was impossible for me even to guess at the kind of tumor contained within the cranial cavity. It surely was not an abscess; there had been no rise of temperature, and abscess predisposes less to optic neuritis than tumor, and I was disinclined to believe it to be a gummatous tumor, and yet the prompt cessation of all the symptoms, even the retina was less edematous, which fol-

lowed upon the thorough mercurialization, threw my thoughts into confusion. I felt justified, however, in allowing the man to return to his home.

On January 23, 1905, he was discharged from the hospital, and I saw him repeatedly at my office. On February 13, early in the morning, for the first time since December 20, 1904, there was an attack of vomiting, followed by much disturbance of the vision. At about 10 o'clock the man came alone to my office. The optic nerve heads were greatly swollen; the retina intensely edematous, while in the macular regions of each eye were large atrophic patches. On February 22, my notes record that he had indulged in walks of several miles without fatigue or disturbance of coordination. His wife had, in the meantime, begged me to forbid the taking of these long walks, because her husband usually had restless nights after such prolonged exercise. On this day, Washington's Birthday, he again came to my office alone; he very greatly enjoyed mingling with and watching the crowds surrounding the President, who was visiting the city. On February 26, he suffered from intense right-sided headaches, and Dr. McMullin was called. There had been short periods of semiconsciousness, and Cheyne-Stokes' respiration, with irregular pulse. Two days later I met Dr. McMullin in consultation, for on this day there had been tonic convulsive seizures involving the arms, with stiffness of the back of the neck, occipital pains and tenderness, and vomiting. At the hour I saw him, 9.30 p.m., he was absolutely free from all these symptoms; the pulse was slow and full; the grasp of the two hands strong and painful to me, and, except for the recollection of the frightful storm through which he had so recently passed, his cheerful disposition was unchanged. Neither fundus presented any new developments. I became all the more certain that there was a solid tumor at the base of the brain, located most probably in the cerebellar region. A return to hospital treatment was advised. On Thursday, March 2, he was admitted to the Episcopal Hospital.

On admission the man was found to be weak and debilitated, yet without actual loss of power in his extremities. His intelligence was good and his memory retentive. The examination of the blood showed the presence of 4,240,000 red blood cells; 9,400 white blood cells, and 90% hemoglobin. Neither albumin nor sugar was found in the urine.

The vision of the right eye was 20/70, of the left 20/200. The outward rotation of the left eye was somewhat impaired owing to a paresis of the external rectus muscle. All movements of the right eye showed no impairment of the extraocular muscles. In neither eye were nystagmic movements observed at any time. The pupils reacted normally to light, convergence and consensually. The fields of vision remained contracted. The ophthalmoscopic examination showed great swelling of the retina, many splotches of degeneration, and small linear hemorrhages, and projection of the optic discs to 6D.

The cardinal symptoms complained of were headache, loss of vision, and nausea. There was spasticity of the muscles of the neck, with retraction of the head. No abnormal signs were obtained in the physical examination of the thorax, while the pulse and temperature were normal. The man was put to bed, mercurial inunctions daily were ordered; only a light diet was allowed. At once marked improvement in general health followed, and continued for 10 days. There were no attacks of vomiting, and but little nausea; he was greatly relieved of his headaches and expressed himself as feeling decidedly better. After two weeks the diet list was enlarged and potassium iodid in large increasing doses was prescribed. This lull was followed by a return of the storm in all its fury. The headaches were usually at the occiput; shooting pains starting from the left frontal region radiated to the parietal and the occipital. The head was retracted. Attacks of nausea and vomiting become frequent. The ocular conditions remained unchanged.

Shortly after admission, Drs. Davis, Stevens, and Ring examined the patient with Dr. Van Pelt, and concurred in the opinion that the case was one of brain tumor, yet they hesitated to decide upon the probable location of the tumor because of the unsteadiness of any localizing symptom.

On March 18, without loss of consciousness, there was a convulsion of the forearms, which lasted for several minutes; the hands became firmly clenched and flexed, while the forearms were flexed on the arms. Relief followed after inhalations of chloroform. As the attack passed off the patient vomited. A similar yet less violent attack followed on the next day, without vomiting, and three days later there was another seizure of shorter

duration than the preceding ones. In this attack the patient was mildly rebuked by the nurse in charge, and requested to control himself. The convulsion immediately ceased, and no similar nervous phenomenon followed.

By this time the patient had become prostrated, the symptoms were greatly intensified, and the outlook more and more unfavorable. At night he was restless and delirious, while in the day he lay lethargic. On March 29, Dr. Wharton Sinkler was consulted. At this examination the patient could walk unattended, but in stepping forward he exhibited a distinct tendency to stagger and to fall towards the left side. The patellar reflexes were abolished. A diagnosis of cerebellar tumor was made with certainty, and the advisability of an operation to open the skull in the position best adapted for an exploration of the left cerebellar region was agreed upon. Although consent for an operation had been obtained from the patient's family, it was deemed wise to continue the medical treatment a few days longer, and then transfer the patient to the service of Dr. Neilson.

Unfortunately the diagnosis was not confirmed in the operation-room, but at the necropsy, for, on April 7, the patient was seized with a violent delirium, from which he fell into a comatose state, and died suddenly four hours after.

Dr. Robertson, the pathologist of the hospital, was allowed to remove the brain, and Dr. Spiller has very kindly examined it. The result of his study of the tumor and the regions affected by it together with remarks upon the clinical course of this very sad case, I am most fortunately able to have him present to you at the conclusion of this report.

It is interesting to speculate upon the probable result had operative procedures been instituted so soon as the abducens paralysis and the intraocular changes had become sufficiently pronounced to render the presumptive diagnosis of a cerebellar tumor positive.

In general, the symptoms were those of intracranial tumor of the hind-brain, rather than of the more forward portions. They appear to be those produced by irritation rather than by the destruction of the basilar centers. Although the intense papillitis was conclusive

of the presence of a tumor, the indefiniteness of the other symptoms hindered the assumption that the tumor occupied the cerebellar region. The chief focal symptoms were those of deviation of the optic axes, with disturbances of direct and binocular vision, and facial palsy; yet, after energetic treatment the paresis of the left external rectus muscle, as well as the diplopia and the facial palsy, greatly disappeared, and when the man was placed under strict hospital regimen the general symptoms all but ceased, for there were no headaches, emesis, or muscular spasms, until the last course, after March 1. The gait, station, and the knee-jerks were not interfered with until very late in the progress of the malady. There was hyperexcitation of the sexual function almost until the end. The general bodily nutrition was maintained up to the last weeks of the man's life.

REPORT BY DR. SPILLER.

The tumor is situated upon the outer portion of the left lobe of the cerebellum, to which it is loosely attached. It is not at all infiltrating, but has made a depression in the left cerebellar lobe 2.5 cm. in depth. The tumor is very firm, almost globular, with somewhat irregular surface, and does not appear to have been adherent to the dura. It is 4 cm. in width, 5.5 cm. in length, and 5 cm. in thickness from above downward. When cut it appears friable and resembles a fibrosarcoma. It has caused some pressure upon the fourth ventricle and thereby moderate internal hydrocephalus of the cerebrum, although the aqueduct of Sylvius is not much dilated and the fourth ventricle not at all. The third and lateral ventricles of the brain are moderately distended, especially the posterior horn of the left lateral ventricle, the floor of which is forced upward by the pressure of the tumor upon the under surface of the left occipital lobe. None of the cranial nerves is implicated in the tumor. The microscopic examination shows that the tumor is a fibrosarcoma.

The specimen is one of much interest. We often operate on tumors of the cerebellum, but I think I have never seen a tumor of the cerebellum which offered more favorable conditions for operation than did this

tumor, situated as it was on the lateral portion of the left cerebellar lobe, and not infiltrating the cerebellum in the least. From its location it would have been seen as soon as an opening were made in the skull. The chances are that it would have been entirely removed, and that the patient would have recovered with no return of symptoms. As it is a fibrosarcoma and very hard, it is not likely that it would have recurred. Anyone interested in cerebral surgery cannot but deeply regret that operation could not have been done, as if it had been done the case would probably have been one of the most brilliant on record. It is striking that there should have been involvement of the left external rectus muscle, because none of the cranial nerves were directly implicated in the tumor. The tumor being on the left side of the cerebellum, it must have distorted the left sixth nerve more than the right. It is remarkable that the right facial nerve was involved at all. The improvement of symptoms under iodid and mercury does not mean that a tumor is a gumma. We are all familiar with the fact that the symptoms of tumor often disappear under the administration of mercury and iodid, at least for a time. The early choked disc and the character of the neuroretinitis might have suggested that the tumor was in the cerebellum.