

by Tizzoni's antitoxin, with incubation periods after birth respectively of two, nine, one and seven days, of which the last only recovered. At to the general statistics of tetanus sero-therapy, he quotes a letter of Mr. Hewlett, which is perhaps, the latest summary of the statistics, and in which he says: "I have been able to collect records of 42 cases of tetanus treated with antitoxin, nearly all traumatic, and of these, 15 died and 27 recovered, giving a mortality of about 36 per cent."

## TWO CASES OF TUMOR OF THE BRAIN, WITH AUTOPSY.<sup>1</sup>

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THE literature on the subject of brain tumor has grown to such proportions within the last few years that a mere narration of more cases is no longer justified, unless they offer certain points of new and peculiar interest. The two following cases, in certain respects, fulfil both these requirements, and therefore seem worthy of being added to the constantly-growing list. They both occurred in the services of Drs. Putnam and Elliot at the Massachusetts General Hospital, to whom I am indebted for the privilege of reporting them.

The histories which follow are taken, in great part, from the out-patient and house records of the hospital.

CASE I. J. M., thirty, married. First seen February 13, 1895, at the neurological out-patient department of the Massachusetts General Hospital.

Family history negative.

Personal history negative, except that three years ago he was struck on the head by a bucket of refuse falling about twenty feet. His scalp was severely cut. Headache persisted from that time on, localized chiefly on the top and left side of the head. Two years after the injury a small lump appeared in the median line, in front of the coronal suture, about as large as the tip of the thumb. This growth constantly increased until it had reached the size of a hen's egg. Six months later his eyesight became impaired, the disturbance of vision beginning in the right eye. Double optic neuritis was found as its cause. Following this he began to be unsteady in his gait, without having definite paralyses. There was at times vomiting and constant severe headache. The combination of symptoms forced him to give up his work, and in June, at Dr. Putnam's advice, he was admitted to the hospital with a view to operation. Dr. Putnam had thought it possible that the growth was a simple hyperostosis.<sup>2</sup>

The hope in advising operation was that a bony growth extending inward was causing pressure on the brain, which its removal might entirely relieve.

Examination at the time of entrance showed a rugged, healthy-looking man, with symptoms already noted. He was unable to stand firmly with closed eyes, and, in general, was suffering acutely. The tumor at the vertex was tender on deep pressure, somewhat spongy in consistence, and with an enormous blood-supply, as shown when the head was prepared for operation — facts of importance in view of later developments. There was no ridge nor depression between it and the skull.

The operation was done by Dr. J. W. Elliot, July

<sup>1</sup> Read before the Clinical Section of the Suffolk District Medical Society, October 16, 1895.

<sup>2</sup> The case was shown by Dr. Putnam at the recent meeting of the American Neurological Association, in connection with a discussion on Hyperostosis Cranii.

2d. An incision with long left and short right arm was made to left of median line. Periosteum removed with the flap. At left border of tumor a one and one-half inch trephine hole was made and enlarged with rongeur forceps. The bone was half an inch thick, looked porous, and bled so freely that the hemorrhage could only be checked with wax. A purple tumor crowded up into the opening, which was enlarged until normal dura was found, distinguishable from the darker tumor area. There was no apparent connection between the tumor of the bone and that of the brain. Much blood had been lost during the operation, and the patient was put to bed after hastily drawing the flaps together with silkworm-gut, leaving gauze drains at the four corners. Late at night the patient recovered consciousness, but was stupid and drowsy.

July 4th. Takes liquids well; rejects enemata. Too stupid to chew solid food. Tongue coated. Pupils react sluggishly. Can with difficulty be made to talk, and never intelligently. Passes urine and feces involuntarily.

July 5th. Wound dressed. Wicks started. Bled considerably. Fresh dressing and firm bandage.

July 7th. Wicks out; no bleeding. Stitches out; some bits of wax oozing from the wound.

July 11th. Eats soft solids and liquids; cannot chew meat. Is able to retain feces and urine. Gradually increasing paresis of right arm and hand. Talks incoherently on various subjects. Visitors say he is not intelligent in his allusions to people and events.

July 19th. Face not so much flushed as heretofore. Bandage off. Seems to be somewhat clearer mentally. Tongue protruded slightly toward the right. Paresis of right arm. Cannot move eyes to the left. Legs unaffected. A bulging, pulsating mass appears through the wound.

Patient again prepared for operation, which was done by Dr. Elliot, July 23d; chloroform anesthesia. The wound was opened in line of old scars. Bleeding fairly controlled in the usual way. The tumor bulged through the opening in the skull. Bone bitten off with rongeur forceps, and bleeding points plugged with wax. The loss of blood was great. A large area of bone was removed by the chisel, hammer and bone forceps, until the tumor was exposed. Tumor shelled out with the fingers, leaving pieces here and there adherent. The new growth was found mostly to the left of the median line. A ligature had been passed through the dura in front of and back of incision to secure the longitudinal sinus in case it was patent. Patient very weak. In spite of every effort he died a few hours later.

*Autopsy.* — Skull cap only removed. Site of tumor brought into view, involving the superior longitudinal sinus and both hemispheres on the mesial surfaces.

*Microscopic Examination of Bone and Tumor.* — Examination of the bone showed it to be partially solid, apparently a simple hyperostosis, but for the most part infiltrated by an extremely cellular new growth.<sup>3</sup> Examination of the brain tumor showed it to be an endothelioma, with origin from the membranes.

In this case there are a number of points of unusual interest, to which I shall rather briefly allude, in the hope that the following discussion may bring them forward in greater detail:

<sup>3</sup> Microscopic sections of the bone were carefully prepared by Dr. E. H. Nichols.

(1) The history of head injury and its possible relationship to the growth developed later. As already stated, the patient had been struck on the vertex of the head some three years before his death. From this blow his symptoms, at least those of a subjective sort, dated. There was no fracture at the time of the injury, nor did the swelling on the skull appear for two years. The evidence from the microscopic study of the tumor is that it had its origin in the membranes, and secondarily invaded the bone. The similarity of the tumor in the brain and in the bone makes it evident that we have to do with one and the same growth. If trauma is ever to be regarded as an exciting cause of tumor formation, this is a case in which it may well be conceived as acting. The late appearance of the bony tumor would find its explanation in the fact that the new growth originated in the membranes, and later, after months had elapsed, invaded the bone. The hypothesis of a primary hyperostosis, with a secondary infiltration by the new growth, seems, in view of all the facts, improbable.

(2) The second matter of interest is the question of diagnosis in such a case. The original probable diagnosis was simple hyperostosis cranii, with exostosis inward as well as outward, inducing optic neuritis, headache and vomiting. There were no paralyses which, had any been present, might have led to a stronger suspicion of actual brain involvement. That distinct symptoms closely resembling those of brain tumor may arise from overgrowth of the skull is amply shown by Dr. Putnam's cases of hyperostosis, abstracted in the *Boston Medical and Surgical Journal* for October 10, 1895.<sup>4</sup> As points in differential diagnosis, stress should probably be laid on pain produced by deep pressure, and the somewhat yielding consistency of the bony tumor. These conditions would be more likely to indicate the presence of a neoplasm than a simple bony hyperplasia. It is probable that uncomplicated hyperostosis is unaccompanied by pain, or marked changes in the consistency of the bone indicative of decreased density.

(3) There were no marked paralyses observed before operation, although the tumor was found to involve the superior longitudinal sinus in close proximity to the areas of the brain supposed to preside over movements of the leg and trunk. After operation the legs remained unaffected, but a paresis of the right arm developed, for which we are able to offer no adequate explanation.

(4) The histological character of the new growth demands a few words. It was of mesoblastic origin, and to be classed under the general head of the sarcomata. It was undoubtedly primary, as already stated, in the membranes of the brain, secondary in the adjoining bone, and had no metastases. From the peculiar arrangement of its cells and its source of origin the growth is more accurately described as an endothelioma containing numerous concretions, sufficient in number to bring it under the heading of the psammoma, one of the more unusual of the brain tumors, classified by Starr<sup>5</sup> as very rare.

(5) On its surgical side the case was of interest, owing to the great vascularity of the field of operation, and consequent difficulty in controlling hemorrhage.

CASE II. J. H., thirty-two, single, Greek. First

seen in out-patient department, Massachusetts General Hospital, June 20, 1895, and carefully examined by Dr. Putnam a few days later.

There was no venereal history. One year before he was first seen, he had had an operation on the left testicle, about which no accurate information could be gained. The affection was thought probably to be tuberculosis, but this was merely a supposition, afterwards shown to be incorrect.

A few days before he first came to the hospital, the patient noticed numbness and prickling of the right forefinger and thumb, which afterwards spread to the whole hand and arm, and rapidly became complicated by muscular weakness. When first seen by Dr. H. C. Baldwin, the patient had complained only of sensory disturbances, which had led to the provisional diagnosis of paresthesia. Twelve days before there had been two temporary attacks of numbness of the right half of both lips, associated with great difficulty of speech, but without aphasia. Those attacks lasted about three minutes. When examined by Dr. Putnam the patient complained of steadily increasing weakness of the hands, which was so great that he could make absolutely no movements of his fingers. Two days before he was able to make all movements, though feebly. Electrical examination showed a slight quantitative impairment of reaction for flexors and extensors of forearm. At time of first careful examination the movements at the wrist, elbow and shoulder were feeble, but present. Sensibility to contact seemed perfect.

The patient was admitted to the hospital July 9th. Examination then showed an increase in the paresis of the right side. The right side of the tongue is said to have felt numb, and the right leg began to be involved. He was never unconscious, but had had a more or less constant headache since the onset of the sensory disturbance. It was learned also that ten days before he had fainted after taking a warm bath and had vomited. He was unable to walk rapidly because "he felt tired," rather than from a paretic condition of the legs. The pupils were equal and responded to light. Several examinations by Dr. Cheney failed to reveal any trace of optic neuritis. Both groins were full of small, discrete glands, not tender. Epitrochlear and cervical glands were also to be felt. Knee-jerks were present and normal. Paralysis of flexors and extensors of right arm was incomplete. The arm was held at an angle of about 10° of flexion, but could be extended without pain against some tension. Forearm semi-prone; could not be supinated. Tongue protruded in the median line. Eyes did not turn to the left as well as they should. The left eye especially deficient. Slight facial paresis on the right. Chest examination negative.

July 11th. Disturbed because operation was postponed for several days. Had three attacks, during which he could not talk, lasting a half-hour. No muscular spasms.

July 13th. Has vomited several times a clear, greenish vomitus.

July 14th. Noted a lack of voluntary control over muscles. A request to perform a certain motion with the arm would be followed by an aimless effort to comply. Makes the statement that "it is too much exertion to move the arm."

July 15th. A spasm occurred in which the right arm was flexed, the fingers clenched, the face drawn

<sup>4</sup> Reported at annual meeting of American Neurological Association.

<sup>5</sup> Nervous Diseases by American Authors, p. 471.

to the affected side, the leg remaining unaffected. Apart from some apathy there was no marked mental disturbance.

July 16th. Operation by Dr. J. W. Elliot. Chloroform. Semilunar incision, with convexity upward. Skull exposed lying over left motor area of the brain as near as possible to region for movements of the arm. Trephine opening three-fourths the size of a silver dollar, with centre about over the fissure of Rolando. Dura opened. Brain looked yellowish and somewhat unnatural. Brain pulsated. No attempt was made to remove the new growth. The dura was loosely united. Skin-flap sewed with interrupted sutures, leaving slight gaps for drainage. Very little bleeding. Good recovery from chloroform, with some nausea.

July 17th. Feels better than before the operation. Talks with considerable difficulty; mouth drawn to the left. Tongue protruded slightly toward the right. Both knee-jerks absent. Right ankle-clonus.

July 18th. Took liquids well, with occasional slight nausea; no vomiting. Wound in good condition. Pulsation of brain may be felt.

July 19th. Talks with more difficulty, and has trouble in finding the right word. Words sometimes suggested by showing objects, or by asking if he means so and so.

July 21st. Appetite improving, and talks more easily than before. Thinks he is better.

July 22d. Still seemed to be improving in the morning. Was seen by Dr. Putnam, who found both knee-jerks absent, but right ankle-clonus. Mouth screwed to left. Tongue protruded slightly to left. Twitching of right hand. Paralysis of extensors of right wrist. Paresis of right arm. At 10 p.m. passed urine involuntarily, and continued doing so all night. Otherwise no change, except slightly more difficulty in talking. A second operation was postponed, since the patient, on the whole, seemed improving.

July 23d. Slightly worse. Incontinence of urine.

July 24th. Stopped talking entirely, but seemed to understand part of what was said to him. Ate very little. Right ankle-clonus no longer present. Too weak to operate.

From this time on the patient grew progressively weaker. Râles were heard over both lungs, more on the left side. No sign of intelligence. Pupils unequal; left three times as large as right, and reacting sluggishly to light. Right pupil does not react. Died quietly on the evening of the 27th, eleven days after the operation.

**Autopsy.** — For the following careful autopsy report I am indebted to Dr. Harvey W. Cushing, of the Massachusetts General Hospital.

Body greatly emaciated. In region of left parietal eminence scar of a curved incision about four inches long. Left testicle absent.

**Head.** On removing scalp, area of bone, size of a silver dollar, over centre of motor area, lacking, through which a small cut in the dura could be seen, with brain slightly bulging through it. On removing calvarium and dura, left hemisphere evidently larger than right. Convolutions about fissure of Rolando broadened, flattened and yellowish. Veins and pia between these convolutions smaller and indistinctly outlined. On palpation a "hard core," seeming size of a pigeon's egg, could be distinguished. Vertical sections, one centimetre thick, made, beginning at anterior lobe. The third section disclosed in the right hemisphere a tumor, apparently incapsulated, somewhat

superficial and anterior to the motor area. It was slightly irregular in outline, of the size of a chestnut, dark reddish-brown in color and fairly firm to the touch. The next section (through the fornix) passed through a mass in the left hemisphere similar to that just described, but considerably larger. It lay about a half-inch under the surface in the motor area. The white matter for a considerable distance about these bodies was soft and yellowish in color. The tumors were not uniform in appearance, but were spotted with yellowish-white points, looking like tubercles. Brain otherwise negative. No excess of ventricular fluid. Meninges normal.

On opening the abdominal cavity the peritoneum was found moist; no free fluid.

**Thorax.** Pleurae smooth and free from adhesions, except over right middle lobe and diaphragmatic surface of lower lobe. Left upper lobe negative. Lower lobe firm, dark red, did not sink in water. From cut surface reddish watery fluid could easily be squeezed, and purulent fluid from small areas corresponding to swollen bronchi. Right lung small, calcified; grayish areas at apex. The whole middle lobe apparently involved in the tumor formation. Pleura adherent over it. In the lower lobe were several other areas, varying in size up to a chestnut, some dense, hard, cartilaginous and glistening white, others dark, similar to those in the brain. There was also a large mass in the lower part of the lobe, adherent to the diaphragm through pleural adhesions. This contained a fluid material under some tension; the mass itself had apparently broken down and seemed myxomatous.

**Heart.** Nothing abnormal.

**Abdomen.** Stomach and intestines negative, except for an ulcer the size of a five-cent piece in the ilium, shallow, with irregular edges and punched-out appearance, situated opposite the mesentery. The color was, like that of the brain tumors, a dark reddish-brown.

Spleen contained two definite, isolated tumors, about size of a cherry, and macroscopically like those of the brain.

Liver contained five or six nodules up to size of pigeon's egg, of similar character.

Kidneys, pancreas, adrenal glands and right testicle were normal.

**Anatomical Diagnosis:** Absence of left testicle; multiple tumors of varied appearance in brain, spleen, liver and lungs; broncho-pneumonia; ulcer in intestines; operation wound over the largest tumor in the brain substance.

**Histological Examination** was made by Dr. Mallory for organs other than the brain. Certain nodules in lung and liver consisted of large round cells, many necrotic, and often associated with much hemorrhage, corresponding to type found in brain. Other nodules in lung and liver were made up of larger and smaller islets of hyaline cartilage and of glands often dilated into small cysts lined with cylindrical epithelium and containing more or less secretion and broken-down cells. There was no indication of sarcomatous structure in these nodules. Chondro-adenoma and sarcoma are therefore the two types of tumor found in the organs, undoubtedly originating from the original new growth in the testicle. The tumors of the brain were sarcomatous in structure, of the large-round-cell variety, extremely hemorrhagic in character, and in many places showing marked evidence of necrosis. From a study of the various nodules it is clear that we have to do in this growth with a mixed tumor, perhaps best included under the head of the teratomata, the original growth being situated in the testicle, and removed surgically some three years previously.

The theory of metastasis in the ordinary sense would hardly apply to the secondary nodules as seen in this case, since it must be presupposed that considerable masses, emboli of the original tumor, were

detached, in order to give rise to secondary growths containing so great a variety of tissues, namely, sarcoma, adenoma, chondroma. It is also to be noted that each of the tissues concerned in the various tumors is mesoblastic or hypoblastic in origin, and in no case epiblastic, thereby forming an interesting analogy with and contrast to the so-called dermoid cyst, more common in the female, whose contents (hair, teeth, nails, etc.) are all of epiblastic origin. Details of this would, however, lead us too far. Of particular interest to the present discussion are the growths in the brain. These, as stated, were sarcomatous, and had no other organ been examined, the tumor would undoubtedly have passed as a round-celled sarcoma, instead of a mixed tumor, which it, in reality, was. Of interest is the attempt to explain the method of transmission of the growth from the testicle to the brain. Three hypotheses are open, as suggested by Dr. Councilman:

(1) Emboli of the original mixed tumor were carried to the lung, and there, as it were, were sifted, permitting only the sarcomatous element to pass through the lung circulation to the brain, and there develop as sarcomata.

(2) It is possible that an open foramen ovale existed, which, in the light of the autopsy, is not likely.

(3) Most probable appears the view that the secondary growths in the brain were metastatic, from nodules already developed in the lung, and therefore to be regarded as the later infection. The same applies to the other organs involved.

The comparative rarity of the growth and its unexpected distribution justify this rather exhaustive pathological report.

To summarize briefly the main points in this case:

One year before the patient's first appearance at the hospital he had had a testicle removed for unknown disease. No symptoms during that time. A few days before coming to the out-patient department paresthesia of right forefinger and thumb, which soon became complicated by muscular weakness in the same hand and arm. Increase of paresis, which remained for the most part monoplegic in character, although the face and leg later became somewhat affected. No marked headache; no optic neuritis. Insignificant vomiting, anomalous reflexes. Examination of the organs — notably the lung — negative. Rapid change for the worse; operation; death. Autopsy, showing multiple tumors in the viscera — only those in the brain, however, having given rise to observed symptoms during life.

Of general medical interest is the question whether a more careful examination would not have revealed the presence of disease of the lungs. This, judging from the autopsy showing, we believe must have been the case. Had such disease been discovered during life, would not the operation have been contraindicated?

Neurologically interesting is the primary disturbance of sensation, induced by a lesion lying in or under the motor sphere of the brain. It would seem to be another case in support of the generally-accepted view that the motor cortex is a sensory area as well. The presence of ankle-clonus in the absence of the deep reflexes — knee-jerk, as observed over a considerable length of time in this patient — must be looked upon as a neurological curiosity.

The two cases, taken together, are in many ways

instructive. In both cases a partial error in diagnosis was made, which the unusual character of the disease justified. Operation in the first case, if undertaken at the time the bony exostosis first made its appearance, might have proved successful, though this is extremely doubtful. Operation in the second case would naturally have been unavailing at any time, since the disease was generally disseminated throughout the body. Both cases must be added to the long list of fatal results because of the nature of the disease rather than through any fault in the operative procedures.

## A CLINICAL TEST OF SOME OF THE SO-CALLED ORGANIC EXTRACTS.<sup>1</sup>

BY FREDERIC COGGESHALL, M.D.,  
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I KNOW that to the more conservative members of this Society it must seem a work of supererogation to offer evidence of the worthlessness of the preparations which are the subject of this paper. My excuse for asking your attention to some clinical tests of cerebrine, carleine and their congeners is that it has come to my knowledge from time to time that these preparations were actually being prescribed by members of the Massachusetts Medical Society, and, as the unfavorable results of such experiments are seldom reported, I have thought that a conclusive test carefully made and frankly reported might be of service to some of the gentlemen who had thought these preparations worthy of a trial.

I shall therefore offer you the results of twenty-three cases in which cerebrine, cerebrin, ovarine and testiculine were used long enough to give a fair test of their value. I should have investigated the other preparations of the same class had not the evidence afforded by those I mention seemed so conclusive that I thought it a waste of time to carry the trial any farther.

It seems to me that it is seldom safe to say that any new system of treatment is, *a priori*, absurd, and I can hardly agree with those who think that in the nature of things the theory on which the supposed effects of the organic extracts are explained must be nonsense. We know too little of "the nature of things" to hazard such off-hand conclusions. I well remember the first case of myxedema in which I gave the thyroid-gland treatment. It was only a little more than three years ago, and the family physician of the patient, a man deservedly respected in this community as an excellent practitioner, simply sneered and laughed in a good-natured way, at the whole thing as absurd. Yet this case has since been reported by the gentleman for whom I was giving the injections as a brilliant success, and we all believe to-day, in thyroid therapy.

But I feel that I have seen, in my own experience, enough to convert into confirmed disbelief the natural scepticism with which I regarded the theory of organic extracts in general, lacking as this theory does, all proof from the present state of physiological knowledge.

The theory I allude to has been stated by Dr. Hammond himself with perhaps as near an approach to clearness as it is capable of. His own words are these:

"That all the organs of the body possess the power,

<sup>1</sup> Read before the Clinical Section of the Suffolk District Medical Society, October 16, 1895.